THE LANCET.

A Journal of British and Foreign Medicine, Surgery, Obstetrics, Physiology, Chemistry, Pharmacology, Public Health, and News.

TELEGRAPHIC ADDRESS—LANCET, WESTRAND LONDON TELEPHONE NUMBER—GERRARD 5356

No. III. of Vol. I., 1918.
No. 4925. Vol. CXCIV. LONDON, SATURDAY, JANUARY 19, 1918. Price 8d.

J. & A. CHURCHILL'S NEW BOOKS.

THE MEDICAL DIRECTORY, 1918. 74th Annual Issue. 16s. net; postage 8d.
THERAPEUTIC IMMUNISATION; Theory and Practice. By W. M. CROFTON, M.D. 7s. 6d. net.
REAGENTS AND REACTIONS. By EDGARDO TOGNOLI, M.D. Translated by C. AINSWORTH MITCHELL, B.A., F.I.C. 6s. net.
A SHORT PRACTICE OF MIDWIFERY. By HENRY JELLETT, M.D. 7th Edition. 4 Coloured Plates. 236 Text-figures. 12s. 6d. net.
HALE WHITE'S MATERIA MEDICA. With War-Time Regulations. 16th Edition. 7s. 6d. net.
ELEMENTARY HYGIENE FOR NURSES. By H. C. R. DARLING, M.D. 13 Illustrations. 3s. net.
AN EPITOME OF MENTAL DISORDERS. Special Chapter on Shell Shock. By E. F. BALLARD, M.D. 6s. net.
MASSAGE: Its Principles and Practice. War Deformities Considered. By J. B. MENNELL, M.D. 140 Illustrations. 8s. 6d. net.
London: J. & A. Churchill, 7, Great Marlborough-street, W. 1.

THE REFERENCE BOOK FOR THE BUSY PRESCRIBER.
Price 10s. 6d. net; post free (inland) 10s. 10d.

SQUIRE'S POCKET COMPANION.
SECOND EDITION (REVISED).
"*The POCKET COMPANION shows evidence of considerable judicious forethought in the selection of data likely to be of use to a wide class of readers.*"—THE LANCET.
Published by J. & A. Churchill, 7, Great Marlborough-st., London, W. 1.

Now Ready. Fourth Edition. Pp. xxiv.+1045. With 47 Illustrations. Price 18s. net.
MONRO'S MANUAL OF MEDICINE.
"An exposition of medicine that is thoroughly in accord with the best teaching of the present day."—THE LANCET.
Baillière, Tindall & Cox, 8, Henrietta st., Covent Garden, London, W.C. 2.

Now Ready. Twelfth Edition. Pp. x.+642. With 350 Illustrations. 18s. net.
GREEN'S PATHOLOGY.
Revised by W. C. BOSANQUET, M.D., & W. W. C. TOPLEY, M.B.
"Students of all grades will find that this work will meet their wants."—THE LANCET.
Baillière, Tindall & Cox, 8, Henrietta-st., Covent Garden, London, W.C. 2.

Now Ready. Royal 8vo. Pp. xii.+317. With 322 Illus. Price 15s. net.
TINEL'S NERVE WOUNDS:
SYMPTOMATOLOGY OF PERIPHERAL NERVE LESIONS CAUSED BY WAR WOUNDS.
With Preface by Professor J. DEJERINE.
Revised and edited by CECIL A. JOLL, F.R.C.S. Eng.
Baillière, Tindall & Cox, 8, Henrietta-st., Covent Garden, London, W.C.2.

Now Ready. Pp. xi.+289. With 3 Charts. 5s. net.
ON ALCOHOLISM: Its Clinical Aspects and Treatment.
By FRANCIS HARE, M.D., Medical Superintendent of the NORWOOD SANATORIUM, Beckenham.
"Marked by candour, common sense, and moderation ..... likely to become the standard text-book."—BRITISH MEDICAL JOURNAL.
London: J. & A. Churchill, 7, Great Marlborough-street.

BY C. HAMILTON WHITEFORD, M.R.C.S., L.R.C.P.
NOW READY.
ACUTE APPENDICITIS
(Practical Points from a twenty-five years' experience).
Price 4s. net.
Also,
AN OPERATING THEATRE IN PRIVATE PRACTICE
(With Illustrated Supplement). Price 3s. 6d. net.
London: Harrison & Sons, 45, Pall Mall, S.W. 1.

IN THE PRESS.
BURNS AND THEIR TREATMENT,
including DERMATITIS FROM HIGH EXPLOSIVES.
By J. M. H. MACLEOD, M.A., M.D., F.R.C.P.,
Physician, Diseases of the Skin, Charing Cross Hospital, Royal Flying Corps Hospitals, &c.
Cloth. Foolscap 8vo. Illustrated. 164 pp.
Henry Frowde and Hodder & Stoughton, Oxford Press Warehouse, Falcon-square, London, E.C. 1.

Second Edition. 8 Plates and 36 Figs. Price 7s. 6d.
BELLAMY GARDNER'S SURGICAL ANÆSTHESIA.
"Its pages focus much valuable information."—BRIT. MED. JOUR.
London: Baillière Tindall & Cox, 8, Henrietta-st., Covent Garden, W.C.2.

DR. HARRY CAMPBELL.
THE BIOLOGICAL ASPECTS OF WARFARE. Price 1s. net.
"ON TREATMENT." 3rd Impression. Price 5s. net.
Baillière, Tindall & Cox, 8, Henrietta-street, Covent Garden, W.C. 2.
FLUSHING AND MORBID BLUSHING. Price 10s. net.
HEADACHE. Price 12s. net.
H. K. Lewis & Co., 136 Gower-street, W.C.1.

FOURTH EDITION. JUST PUBLISHED.
8vo. Pp. 260. With 40 Illustrations. Cloth. 6s. net.
SQUINT: its Causes, Pathology and Treatment.
By CLAUD WORTH, F.R.C.S.,
Surgeon, Royal London Ophthalmic Hospital (Moorfields), &c.
Bale, Sons & Danielsson, 83, Gt. Titchfield-street, W.

TWO USEFUL BOOKS by E. L. ASH, M.D.,
for those undertaking treatment of War Neuroses and allied Mental and Nervous Disorders —
1. HOW TO TREAT BY SUGGESTION - - 1s. net.
2. MENTAL SELF-HELP - - - - - - - 2s. 6d. net.
Mills & Boon, 49, Rupert-street, London.

NEW EDITION. In 2 vols. 45s. net.
DEFORMITIES, including DISEASES of the BONES and JOINTS. A Text-book of Orthopædic Surgery.
Illustrated by 70 Plates and over 1000 Figures, and by Notes of Cases.
By A. H. TUBBY, M.S. Lond., F.R.C.S. Eng.
Second Edition: "The standard text-book in English on the subject."—THE LANCET.
First Edition: "Standard work on the subject in the English language."—BRITISH MEDICAL JOURNAL.
Macmillan & Co., Ltd., St. Martin-street, London, W.C.

JUST OUT
CARMAN AND MILLER'S
ROENTGEN DIAGNOSIS OF ALIMENTARY DISEASES
JUST OUT

This work makes its greatest appeal, of course, to the roentgenologist, but it has a very practical value to the general practitioner, the surgeon and specialist as well. Why? Because it shows the unusual diagnostic possibilities of the Roentgen ray; because it points out those cases in which the ray may prove the determining factor in the diagnosis.

"*Taken as a whole this work is a valuable record of systematic and careful observation of cases; it is well got up; the letterpress is excellent; the illustrations are well chosen, profuse, and typical of the conditions described. It is the best book which has as yet been published on the subject, and it should become a standard text-book.*"—BRITISH MEDICAL JOURNAL.

Octavo of 550 pages, with 504 illustrations. By RUSSELL D. CARMAN, M.D., Head of Section on Roentgenology, and ALBERT MILLER, M.D., Second Assistant in Section on Roentgenology, Division of Medicine, in The Mayo Clinic, Rochester, Minn. Cloth, 25s. net.
Sent, Carriage Paid, on Receipt of Price.
W. B. SAUNDERS COMPANY, 9, Henrietta Street, London, W.C. 2.

"COFECTANT" LOZENGES

These Lozenges are safe for all persons, including young Children, and they should be taken whenever there is a soreness or hoarseness in the throat.

The surfaces and membranes of the mouth and throat, moistened by saliva charged with "COFECTANT" will be sterilized and the air on its way to the lungs will be rendered aseptic.

1/3 per Box from all High-class Chemists.

EDWARD COOK & CO., Ltd., Bow, LONDON, E.3.

Valentine's Meat-Juice

For **Quieting** the **Irritable Stomach,** for **Aiding** the **Digestion** and for **Sustaining** and **Strengthening, Valentine's Meat-Juice** is **Extensively Employed** in the treatment of

Phthisis.

Dr. Gouel, *Physician in Chief of the Villepinte Hospital for Consumption, Paris, France:* "VALENTINE'S MEAT-JUICE succeeds well in cases of Anæmia and in the treatment of Tuberculosis in an advanced stage when the stomach is intolerant."

Dr. Pietro Borromeo, *Physician and Surgeon of the Hospital of Rome, Italy:* "I have tried VALENTINE'S MEAT-JUICE in the Tuberculosis Division of the Hospital of the Holy Spirit, and have proved the great advantages that it renders for the nutrition of the consumptive. Pleasant to the taste of the most fastidious of the sick, it does not irritate the stomach, but stimulates the peptogastric functions so as to improve notably the appetite, even in cases of continuous and high fever and of extreme loss of strength."

For sale by European and American Chemists and Druggists.

VALENTINE'S MEAT-JUICE COMPANY,
RICHMOND, VIRGINIA, U. S. A.

D 186

THE LANCET.

No. 4925. LONDON, SATURDAY, JANUARY 19, 1918. Vol. CXCIV.

CONTENTS.

The whole of the literary matter in THE LANCET is copyright.

CASES of Cerebro-spinal Fever in the Royal Navy—August 1st, 1916–July 31st, 1917. By Temp. Surgeon-General H. D. ROLLESTON, C.B., M.D., F.R.C.P., R.N., Consulting Physician to the Royal Navy; Senior Physician to St. George's Hospital, London. .. 87

ORIGINAL ARTICLES.

The Grouping of Meningococci into "Types." By P. FILDES, M.B., B.C. Cantab., Hon. Staff Surgeon, R.N.V.R. (Working on behalf of the Medical Research Committee); and S. L. BAKER, M.R.C.S., L.R.C.P. Lond., Temporary Surgeon, R.N. 92

A Clinical Contribution to the Study of P.U.O. By W. PASTEUR, C.M.G., M.D. Lond., F.R.C.P. Lond., Temp. Colonel, A.M.S.; and BERNARD HUDSON, M.D. Cantab., M.R.C.P. Lond., Temp. Major, R.A.M.C.—(*Illustrated*)..... 94

The Localisation and Removal of Foreign Bodies by the Combined Method of Radioscopy and Operation, with Suggestions for the Standardisation of Methods. By ROBERT KNOX, M.D. Edin., Captain, R.A.M.C. (T.)..... 96

The Treatment of Staphylococcal Infections by Stannoxyl: Furunculosis and Acne. (Method of Grégoire & Frouin.) By ARTHUR COMPTON, B.A., M.B. R.U.I., D.Sc. N.U.I., Captain, R.A.M.C. (Temp.)... 99

A Case of Splenomegaly Treated by Splenectomy, with Report on Condition of the Blood and Spleen. By G. R. FOOTNER, F.R.C.S. Eng., Medical Inspector, Sudan Government; and R. G. ARCHIBALD, M.B., Ch.B. Edin., D.S.O., Captain, R.A.M.C.—(*Illustrated*)..... 101

Muscular Rheumatism: Its Diagnosis and Treatment by Physical Means. By FRANK RADCLIFFE, M.B., Ch.B. Edin., Medical Officer in Charge of Treatment Departments, Command Depôt, Heaton Park, Manchester..... 102

CLINICAL NOTES:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

Bomb Wound of Abdomen: An Example of Peritoneal Resistance. By D. P. D. WILKIE, M.Ch., F.R.C.S. Edin., Acting Staff-Surgeon, R.N.V.R. 103

Case of Threatening Sepsis of Knee-joint Aborted by Injection of Flavine. By W. HENRY HILLYER, M.D. Durh. 103

A Case of Cutaneous Anthrax in Man Presenting Multiple Lesions. By WILLIAM T. G. DAVIDSON, M.B., Ch.B. Glasg., D.P.H. Camb., Senior Assistant Physician, City of Glasgow Fever Hospital, Ruchill 104

REVIEWS AND NOTICES OF BOOKS.

Radiography and Radio-therapeutics. By Robert Knox, M.D. Edin., M.R.C.S. Eng., L.R.C.P. Lond. Second edition 105

Röntgen Diagnosis of Diseases of the Alimentary Canal. By Russell D. Carman, M.D., and Albert Miller, M.D..... 106

The Principles and Practice of Dermatology. By William Allen Pusey, M.D. Third edition 105

Diseases of the Skin. By Henry Stelwagon, M.D., Ph.D. Eighth edition 105

Morfologia Normale e Patologica dei Globuli Rossi. By Dr. Negreiros-Rinaldi. 106

Parasitology. Vol. X, No. 1... 106

NEW INVENTIONS.

An Italian X Ray Localiser.—(*Illustrated*)..... 106

LEADING ARTICLES.

THE RETIREMENT OF SIR ALFRED KEOGH AND THE APPOINTMENT OF HIS SUCCESSOR 107

A MEDICAL MAN AND A LADY SUPERVISOR..... 108

ANNOTATIONS.

The Treatment of Staphylococcal Infections of the Skin 109

The Part Potato Loaf 109

Eyelashes in the Anterior Chamber 110

Tetanus in Civilian Practice 110

The Diagnosis of Non-tuberculous Pulmonary Disease... 111

SPECIAL ARTICLES.

The Belgian Doctors' and Pharmacists' Relief Fund ... 111

The Control of Venereal Diseases 112

Canada 112

The Services 122

URBAN VITAL STATISTICS:

English and Welsh Towns 118

Scotch Towns..... 118

Irish Towns..... 118

THE WAR.

The Casualty List 113

Casualties among the Sons of Medical Men 113

The Honours List 113

Mentioned in Despatches 116

Foreign Decorations 117

The Medical Services in Mesopotamia and on the Western Front 117

Ministry of National Service: its Medical Organisation 117

CORRESPONDENCE

The Treatment of Wounds Involving the Mucous Membrane of the Mouth and Nose (Captain H. Lawson Whale, R.A.M.C. (T.)) 119

Heart Failure in Pregnancy (Dr. Leslie Thorne Thorne) .. 119

The Administration of Bromide (Dr. Maurice Craig)..... 119

Dr. Lettsom (Dr. S. D. Clippingdale) 126

OBITUARY.

William Laidlaw Purves, M.D. Edin., Consulting Aural Surgeon to Guy's Hospital 120

MEDICAL NEWS.

Bradford Hospital Superintendent 92

Royal Society of Arts Lectures 104

Doctors of Military Age in Ireland 104

A Centenarian Descendant of Old Parr 118

Donations and Bequests..... 119

Examining Board in England by the Royal Colleges of Physicians of London and Surgeons of England: Pass-list 120

Royal College of Surgeons of England: Meeting of Council 120

Society of Apothecaries of London: Pass list... 120

The Practical Study of Biology 120

Lectures on Infant Care 120

Royal Medical Benevolent Fund 121

West London Medico-Chirurgical Society: Presentation to Major H. R. Priestley..... 121

Developments in the Leeds School of Medicine 121

Hospital Accommodation in Scotland..... 122

Notification of Tuberculosis to the Ministry of National Service 122

PARLIAMENTARY INTELLIGENCE.

Notes on Current Topics: The Parliamentary Session.—Medical Examination of Recruits.—National Insurance Administration..... 122

House of Commons 122

INDEX.

VOL. II., 1917..... III.-XX.

TITLE-PAGE.

(*See Notice on p. 108.*)

Appointments.—Vacancies..... 123

Births, Marriages, and Deaths.. 123

Medical Diary 124

Books &c., received 124

Editorial Notices 124

Manager's Notices 124

Meteorological Readings..... 124

Notes, Short Comments, and Answers to Correspondents... 125

Acknowledgments of Communications received..... 125

FOR INDEX TO ADVERTISEMENTS SEE PAGE 2.

JOHN BALE, SONS & DANIELSSON, LTD.,

PRINTERS AND PUBLISHERS OF MEDICAL AND SCIENTIFIC WORK,

are prepared to consider the publication of MSS. on the most favourable terms to the Author. They hold an

UNIQUE POSITION

for effecting a considerable saving in time, labour, and expense, in that the work is all carried out under their personal supervision, and

EXECUTED ON THE PREMISES.

The various departments comprise:

LETTERPRESS PRINTING — LITHOGRAPHIC PRINTING — ILLUSTRATIONS BY LINE AND HALF-TONE PROCESS—DRAWINGS ON STONE—PHOTOGRAPHY—BOOKBINDING—PUBLISHING.

We hold a large and varied stock of Charts, Clinical Figures, Diagrams; also Medical and Dental Card Index Systems.

Catalogue on Application.

83, 85, 87, 89, & 91, GREAT TITCHFIELD STREET, OXFORD STREET, LONDON, W.1.

INDEX

MEDICAL AND OTHER BOOKS AND PUBLICATIONS

PAGE

BAILLIERE, TINDALL & COX:—
Bellamy Gardner's Surgical Anæsthesia .. Cover 1
Campbell—The Biological Aspects of Warfare .. Cover 1
Campbell—On Treatment . Cover 1
Green's Pathology .. Cover 1
Monro's Manual of Medicine Cover 1
Tinel's Nerve Wounds .. Cover 1

BALE, SONS & DANIELSSON:—
Charts, &c. .. 1
Worth—Squint: its Causes, Pathology and Treatment .. Cover 1

CHURCHILL, J. & A.:—
Ballard—An Epitome of Mental Disorders .. Cover 1
Crofton—Therapeutic Immunisation .. Cover 1
Darling—Elementary Hygiene for Nurses .. Cover 1
Hale White's Materia Medica Cover 1
Hare—Alcoholism: Its Clinical Aspects and Treatment.. Cover 1

PAGE

CHURCHILL—(Continued).
Jellett—Midwifery .. Cover 1
Mennell—Massage .. Cover 1
Squire's Pocket companion Cover 1
The Medical Directory, 1918 Cover 1
Tognoli—Reagents and Reactions Cover 1

FROWDE AND HODDER & STOUGHTON:—
Macleod—Burns and their Treatment .. Cover 1
Waring—Surgical Diseases of the Gall-Bladder, &c. .. 4
Waring—Operative Surgery .. 4

HARRISON & SONS:—
Whiteford—Acute Appendicitis .. An Operating Theatre in Private Practice .. Cover 1

HILTON & CO.:—
Ghosh's Materia Medica .. 4

LEWIS & CO.:—
Bennett—Materia Medica and Pharmacy .. 3

PAGE

LEWIS & CO.—(Continued).
Binnie—Manual of Operative Surgery .. 3
Bruce—A System of Radiography 3
Buxton—Anæsthetics .. 3
Campbell—Flushing and Morbid Blushing .. Cover 1
Campbell—Headache .. Cover 1
Coleman and Hilliard—Anæsthetics in Dental Surgery .. 3
Cooper—Sexual Disabilities of Man .. 7
Dawson—Causation of Sex in Man 3
Hellman—Amnesia and Analgesia in Parturition .. 3
Lumb—Systematic Treatment of Gonorrhœa .. 3
Murrell What to Do in Cases of Poisoning .. 3
Rawling—Landmarks and Surface Markings of the Human Body. 3
Young—Mentally Defective Child 3

MACMILLAN & CO.—
Tubby—Deformities, including Diseases of the Bones and Joints .. Cover 1

PAGE

MEDICAL PUBLISHING CO.:—
Lane, Sir A.—Operative Treatment of Fractures .. 4

MILLS & BOON:—
Ash—How to Treat by Suggestion .. Cover 1
Ash—Mental Self-Help .. Cover 1

SAUNDERS COMPANY:—
Carman & Miller—Roentgen Diagnosis of Alimentary Diseases Cover 1

WRIGHT & SONS (BRISTOL):—
Dowse—Lectures on Massage and Electricity in the Treatment of Disease .. 4
Index of Treatment .. 4

MEDICAL LIBRARIES, &c.:—
Baker—Books .. 4
Behnke—Stammering, &c. .. 4
Ketley—Stammering .. 4
Matthews—Wood: Application of Trusses to Hernia .. 4

OFFICIAL AND GENERAL ANNOUNCEMENTS

ASSISTANCIES, MEDICAL .. 50

ASYLUMS, HOMES, &c.:—
Ashwood House, Kingswinford .. 48
Barnwood House Hospital.. 47
Bishopstone House, Bedford.. 48
Brunton House, Lancaster.. 47
Camberwell House, Peckham-road .. 46
Cheadle Royal .. 46
Clarence Lodge, Clapham Park .. 47
Colthurst House School, Alderley Edge.. .. 43
Coppice, The, Nottingham .. 44
Court Hall, Kenton, near Exeter. 44
Dalrymple House, Rickmansworth .. 46
David Lewis Colony, Alderley Edge .. 43
Duff House, Banff .. 47
General Manager, Craven-street . 46
Ghyllwoods Sanatorium 46
Grove House, Church Stretton .. 44
Grove, The, Catton, Norwich .. 44
Haydock Lodge, Newton-le-Willows .. 45
Heigham Hall, Norwich .. 44
Littleton Hall, Brentwood .. 48
London Fever Hospital .. 44
Malling Place, Kent .. 44
Matlock Sanatorium .. 46
Melbourne House, Leicester .. 46
Mendip Hills Sanatorium .. 46
Meyrick, Brighton .. 46
Moat House, Tamworth .. 44
Mundesley Sanatorium .. 46
Newmains Retreat, Lanarkshire.. 46

ASYLUMS—(Continued).
New Saughton Hall, Polton, Midlothian .. 48
Nordrach-on-Dee, Banchory .. 47
Northumberland House, Finsbury Park .. 45
Northwoods House, Winterbourne 48
No. 97, L.O., Strand .. 48
Otto House, West Kensington.... 45
Peckham House .. 45
Pendyffryn Hall Sanatorium, Nordrach-in-Wales .. 47
Plympton House, Plympton .. 44
Portsmouth Corporation Mental Hospital .. 43
Royal Earlswood Institution for Mental Defectives .. 45
St. Andrew's Hospital, Northampton .. 44
St. George's Retreat, Burgess Hill .. 43
Springfield House Private Asylum, Bedford .. 43
Stretton House, Church Stretton. 44
The Grange, near Rotherham .. 44
Vale of Clwyd Sanatorium .. 46
Warneford Asylum, Oxford .. 45
Wye House, Buxton .. 44

FINANCIAL, &c.—
Equitable Reversionary Interest Society .. 48

HEALTH RESORTS, BATHS, &c.
Caterham Sanitarium .. 47
Smedley's, Matlock.. 47

HOSPITAL, INFIRMARY, SANATORIUM, &c., VACANCIES. 48-50

HOUSE & ESTATE AGENTS:—
Bedford & Co., Wigmore-street .. 51
Elliott, Son & Boyton, Vere-street .. 51
Ley Clark, Wimpole-street .. 51

LIFE & FIRE ASSURANCES, &c.:—
National Provident Institution.. 48
Prudential .. 48

MEDICAL ACCOUNTANTS, &c.:—
Turner .. 51

MEDICAL AGENTS:—
Fieldhall, Limited .. 51
Manchester Clerical, &c., Association .. 51
Medical Agency.. 51
Needes, J. C .. 51
Peacock & Hadley .. 51
Turner.. 51

MEDICAL SCHOOLS:—
(LONDON.)
London School of Clinical Medicine .. 41
West London Post Graduate College .. 41

NURSES' ASSOCIATIONS:—
Co-operation of Temperance Male and Female Nurses.. 42
Female Nurses Association .. 42

NURSES' ASSOC.—(Continued)
General Nursing Association .. 42
Hospital for Sick Children .. 43
London Nurses' Association .. 42
London Temperance Nurses Co-operation .. 43
Male Nurses Temperance Co-operation .. 41
Mental Nurses Association .. 42
Mental Nurses' Co-operation 45
Misses Strongwick's Nursing Agency .. 43
Nurses' Association .. 42
Nurses' Co-operation .. 42
Registered Nurses' Society .. 41
St. John's House .. 45
St. Luke's Hospital.. 45
Temperance Association of Male Nurses, Ltd. .. 42
Temperance Male Nurses Co-operation .. 41
The Retreat, York .. 45

OFFICIAL NOTICES:—
City of London Lying-in Hospital .. 41
London School of Tropical Medicine .. 41
Queen Charlotte's Lying-in Hospital.. 41
University of London .. 41

PARTNERSHIPS & PRACTICES. 50

TUTORS & LECTURERS:—
Schnelle—Stammering.. 4
Weymouth .. 41

TRADE AND MISCELLANEOUS ADVERTISEMENTS

AMBULANCES:—
St. John Ambulance—Invalid Carriages.. 5

BOTTLE MERCHANTS:—
Isaacs .. 5

CARRIAGES, MOTORS, &c.:—
Seldam Tyre Co., Ltd.—Seldam Tyres.. 7
Brown Brothers, Ltd.—Duco Leaf Spring Gaiters .. 7
Singer & Co., Ltd.—Singer "10" Doctor's Car .. 7

CHEMISTS & DRUGGISTS:—
Allen & Hanburys—Allenburys Cod-Liver Oil, &c. .. 22
Bolurol .. 20
Angio French Drug Co.—Stannoxyl, Kinectine, Opolaxyl, Urasceptine .. 28
Antiphlogistine.. .. 27
Battley & Watte—Battley's Liquors .. 52
Boots Pure Drug Co.—Oil Solution of Dichloramine-T. 52
Bristol-Myers Co.—sal Hepatica. 37
British Organotherapy Co., Ltd.—Reliable Organotherapeutic Products .. 11
British Oxygen Co.—Oxygen.... 38
Burroughs Wellcome & Co—Soloid Brand Antiseptics .. 29
Wellcome Brand Adrenalin .. 24
Parolein, Laxamel .. 25
Christy & Co.—Glyco-Heroin.... 32
Cook & Co.—Cofectant Lozenges ... Cover 11
Cooper Laboratory for Economic Research—Phenol sulphone-phthalein 40
Crookes' Laboratories—Collosols .. 18
Duncan, Flockhart & Co.—Tuberculins, Vaccines .. 15
Fellows Medical Manfg. Co.—Fellows' Syrup .. 20
Ferber Ltd.—Bienosan Capsules.. 37

CHEMISTS—(Continued).
Gale & Co.—Elixir Cresolis c. Heroin Co., &c.... .. 37
Genatosan, Ltd.—Formamint .. 19
Keppella—Urodonal .. 14
Herlett & Son—Liq. Santal Flav. c. Buchu et Cubeba .. 38
H. K. Mulford Company—Influenza Serobacterin .. 12
Hoffmann-La Roche Chemical Works—Omnopon .. 16
Lambert Pharmacal Co.—Listerine .. 32
Martindale—Am 1 Nitrite Capsules .. 38
May & Baker—Novarsenobillon.. 11
Moore & Co., Ltd—Lymm-Pure-Salt .. 36
Newbery & Sons—Pulvis Jacobi Ver. .. 36
Parke, Davis & Co.—Poliaccine, &c. .. 17
Raimes & Co—Slinger's Nutrient Suppositories .. 38
Richards & Sons—Lactopeptine .. Cover iii
S. F. Charges Co.—Sulphaqua .. 36
Squire & Sons—Elix. Hypophysis Cereb., Elixir Colloid, &c. .. Cover iv
Variaxine Laboratory—Variaxine, Rectoline, &c. .. 31
Wilcox, Jouseau & Co.—Arbrol .. 36
Willows, Francis, Butler & Thompson—Zymol .. 30

DISINFECTANTS:—
Condy's Fluid .. 5
Pearson's Antiseptic Co.—Pacolol, Hycol, Medol .. 31

FOODS—
Allen & Hanburys—Allenburys Foods .. 21
Benger's Food .. 13

FOODS—(Continued).
Blatchley's Diabetic Preparations 40
Brand & Co.—Meat Juice .. 38
Callard & Co.—Diabetic Foods .. 39
Carnrick & Co.—Dry Peptonoids.. 23
Liquid Peptonoids .. 23
Fry's Malted Cocoa .. Cover iii
Maconochie's Potted Meats and Fish Pastes .. 39
Southall Bros. & Barclay—Vitafer .. 39
Valentine's Meat-Juice .. Cover ii
Van Abbott & Sons—Gluten Bread, &c.... .. 40
Vi-Cocoa .. 39
Wander, Ltd.—Ovaltine .. 10

FURNITURE, &c.:—
Carters—Furniture for Invalids and Hospital Supplies.. 34

HOSPITALS (ISOLATION):—
Humphreys, Limited—Iron, Wood and Brick Hospital Buildings, &c. .. 33

MED. & SURG. APPLIANCES —
Allcock & Co.—Vee Lightning Pin Bandage Fastener .. 5
Bailey & Son—Burlington Belt .. 27
Davis-Lukens Sterile Catgut with Dulox Needle.. 40
Davis & Geck—Kalmerid Catgut .. 5
Day—Simplex "08" Infusion Set 9
Down Bros.—Pneumatic Tourniquet.. 8
Hoefflecke—Extension Appliances .. 26
Holland—Patent Instep Supports 34
Millikin & Lawley—Osteology, &c.. .. Cover iii
Robinson & Sons—Gamgee Tissue 5
Timpson & Co.—Reliable Ligatures .. 34
Zeal—Repello Clinical Thermometer .. 5

MINERAL WATERS, &c.:—
Davis & Davis—Natural Mineral Waters .. 40
Hogg & Son—Aerated Lime-Water.. 39

OPTICIANS
Bausch & Lomb Optical Co.—Microscopes .. 7
Watson & Sons, Ltd.—Hæmacytometers .. 40

STATIONERY, &c.:—
Anderson & Son—Doctors' A/c Forms, &c. .. 51

TAILORS, BOOTMAKERS, &c.:—
Burberrys—The Burberry.. 35
Weatherall Burberrys, Urbitor Topcoats, &c. .. 5
Harry Hall—Service Dress R.A.M.C. and Navy .. 51

TOBACCO, CIGARS, &c.:—
Player & Sons—Perfectos Cigarettes .. 39

VACCINE LYMPH:—
Chaumier's Calf Lymph .. 40

X-RAY, &c., APPARATUS:—
Medical Supply Association—Grevillite Improved Diathermy Apparatus .. 35
Siemens Brothers & Co.—New Tungsten Arc Lamp .. 8
Watson & Sons—Sunic X-Ray Plates.. 9

MISCELLANEOUS:—
Box 6479, Knightsbridge—Motorist (Lady).... .. 50
E. L., Liss—Help Attendant..... 50
No. 398, L.O., Strand—Nurse Attendant .. 50

Cases OF CEREBRO-SPINAL FEVER IN THE ROYAL NAVY.

AUGUST 1ST, 1916–JULY 31ST, 1917.

BY TEMP. SURGEON-GENERAL H. D. ROLLESTON, C.B., M.D., F.R.C.P., R.N.,
CONSULTANT PHYSICIAN TO THE ROYAL NAVY; SENIOR PHYSICIAN TO ST. GEORGE'S HOSPITAL, LONDON.

IN addition to the cases of cerebro-spinal fever in the Royal Navy during the third year of the war the total number of cases occurring since the onset of hostilities have been analysed as far as is necessary for purposes of comparison.* The present report contains: (1) Remarks on the incidence of the cases; (2) remarks on some clinical aspects; (3) a summary of the results of treatment.

(1) INCIDENCE OF THE CASES.

During the year August 1st, 1916, to July 31st, 1917, there were 143 bacteriologically proved cases of cerebro-spinal fever as compared with 104 during the second and 170 cases during the first year of the war, the percentages for the first, second, and third years being 41, 25, and 34 of the total 417 cases. The rise during the third year of the war cannot be entirely explained by the increased personnel of the Navy as there was a distinct fall in the number of cases during the second year as compared with the first year of the war, whereas the personnel presumably continued to increase throughout the war. The absolute rise of the naval cases during the third year of the war corresponds with a rise in the number of cases in the civil and military populations,[1] and also with an increased percentage of carriers in the Navy.

Bacteriological examination of the throats of new entries from December, 1916, to the end of July, 1917, made at Haslar (Hon. Staff-Surgeon P. Fildes, R.N.V.R.), Plymouth (Fleet-Surgeon R. S. Bond), Chatham (Staff-Surgeon J. H. Burdett), and of non-contacts (new entries and drafts) at Greenwich (Deputy Surgeon-General P. W. Bassett-Smith, C.B.) showed that out of 46,107 officers and ratings there were 1509 carriers, or 3·3 per cent., as compared with 2·7 per cent. obtained in a similar but smaller collection of cases during the first half of 1916. During the third year of the war the percentage of carriers at different centres varied from 0·1 at Plymouth to 5 at Greenwich and also varied at different periods.

Out of the 143 cases the large depôts at Portsmouth (46), Plymouth (36), the Crystal Palace (18), and Chatham (10) provided 110, or 77 per cent., and sea-going ships 20, or 14 per cent. The Royal Marine Light Infantry Depôt at Deal did not have any case. Out of the 417 cases of cerebro-spinal fever in the Navy during the first three years of the war 310, or 75 per cent., arose in the large depôts at Portsmouth (110), Plymouth (94), the Crystal Palace (59), and Chatham (49), while 42 cases, or 10 per cent., were reported from sea-going ships. No case of proved meningococcic meningitis has occurred at Osborne or Dartmouth during the war.

The *monthly incidence* with the results is here shown:—

	Cases.	Deaths.	Recoveries.
1916			
August	3	1 or 33·3 per cent.	2 or 66·7 per cent.
September	5	1 ,, 20 ,,	4 ,, 80 ,,
October	3	1 ,, 33·3 ,,	2 ,, 66·7 ,,
November	6	3 ,, 50 ,,	3 ,, 50 ,,
December	14	7 ,, 50 ,,	7 ,, 50 ,,
1917			
January	30	13 ,, 43·3 ,,	17 ,, 56·7 ,,
February	22	7 ,, 31·8 ,,	15 ,, 68·2 ,,
March	27	7 ,, 25·9 ,,	20 ,, 74·1 ,,
April	13	5 ,, 38·5 ,,	8 ,, 61·5 ,,
May	11	4 ,, 36·4 ,,	7 ,, 63·6 ,,
June	5	1 ,, 20 ,,	4 ,, 80 ,,
July	4	2 ,, 50 ,,	2 ,, 50 ,,
	143	52	91

* See THE LANCET, 1915, ii., 909; 1917, i., 54.

[1] Information kindly given by Dr. T. H. C. Stevenson, of the General Register Office, and Surgeon-Colonel R. J. Reece, C.B., H.A.C.

The largest number of cases and deaths occurred in January. In the two previous years of the war the largest number of cases and of deaths occurred in February.

Out of the 143 cases 92, or 64·3 per cent., occurred during the first four months of the year, and out of the total 417 cases during the first three years of the war 299, or 71·7 per cent., arose during the first four months of the year.

Monthly Incidence and Mortality during the Three Years of the War.

	Cases.				Mortality.			
	1914–15	1915–16	1916–17	Total	1914–15	1915–16	1916–17	Total
August	0	4	3	7	0	2	1	3
September	0	4	5	9	0	3	1	4
October	0	3	3	6	0	1	1	2
November	1	6	6	13	0	5	3	8
December	2	8	14	24	1	4	7	12
January	27	8	30	65	16	3	13	32
February	60	26	22	108	35	7	7	49
March	35	20	27	82	15	6	7	28
April	24	7	13	44	8	2	5	15
May	12	7	11	30	8	0	4	12
June	6	3	5	14	4	2	1	7
July	3	8	4	15	3	2	2	7
	170	104	143	417	90	37	52	179

Out of the 143 cases 18, or 12·6 per cent., proved fatal within 48 hours of the onset; of these fulminating cases 5 arose in January, 3 in November, 2 in December and in June, and 1 each in the other months except August and May. Twelve, or two-thirds, of the fulminating cases occurred before February, thus conforming to the rule that such cases are commoner at the commencement of than later in an epidemic.

Age incidence.—Among the 143 cases 92, or 64·4 per cent., were under 20 years of age (110, or 76·9 per cent., being under 25 years of age), and the number of cases progressively diminished in the succeeding decades. In the two previous years of the war the percentage mortality of the cases under 20 years of age was lower than in the succeeding decades, whereas in the third year of the war it was considerably higher than in the two succeeding decades. The average age of the 143 cases was 21·5 years, of the 52 fatal cases 21·7 years, and of the 91 recoveries 21·3 years. The extremes of age were 15 and 55 years.

Age-periods.	Number of cases and percentage of the total 143 cases.	Deaths and percentage in the age periods.
15–19	92 or 64·3 per cent.	36 or 38·1 per cent.
20–29	33 ,, 23 ,,	10 ,, 30 ,,
30–39	11 ,, 7·7 ,,	3 ,, 27·2 ,,
40–49	5 ,, 3·5 ,,	2 ,, 40 ,,
50	2 ,, 1·4 ,,	1 ,, 50 ,,
	143	52

The mortality in the same age-periods for the 417 cases during the first three years of the war is given for comparison:—

Age-periods.	Number of cases and percentage of the total 417 cases.	Deaths and percentages in the age-periods.
15–19	265* or 63·5 per cent.	101 or 38·1 per cent.
20–29	100 ,, 24 ,,	49 ,, 49 ,,
30–39	30 ,, 7·2 ,,	15 ,, 50 ,,
40–49	17 ,, 4·1 ,,	11 ,, 64·7 ,,
50–59	5 ,, 1·2 ,,	3 ,, 60 ,,

* 67 of these with 26 deaths, or 39 per cent., being in the boy-training establishments *Impregnable*, *Powerful*, and at Shotley.

Mortality.—Out of the 143 cases, 52, or 36·2 per cent., proved fatal as compared with 35·6 per cent. in the second and 52·9 per cent. in the first year of the war. Among 417 cases of cerebro-spinal fever in the Navy during the first three years of the war there have been 179 deaths, or 42·9 per cent., of which 124, or 69·3 per cent., occurred in the first four months of the years.

Day of death: 5 cases were fatal on the first day, 4 on the second, 7 on the third, 8 on the fourth, 2 on the fifth, 2 on the sixth day; 5 in the second week, 10 in the third week, 3 in the fourth week, 2 in the fifth week, 2 in the sixth week, and single cases on the fifty-seventh and sixty-seventh days. More than half the cases therefore were fatal during the first six days of the disease, and 6 so rapidly that no treatment of any kind was employed; 2 of

them were found dead and had not been under medical observation.

Ranks and ratings.—There were 6 officers: a lieutenant-colonel R.M.L.I. (fatal), a commander (fatal), a lieutenant (recovery), and 3 midshipmen R.N.R. (recoveries). The 137 ratings were seamen 62 (21 deaths), boys (seamen class) 21 (11 deaths), stokers 20 (8 deaths), Royal Naval Air Service mechanics 10 (4 deaths), marines 6 (1 death), ship's stewards 5 (1 death), officer's stewards 3 (1 death), sick berth staff 3 (0 death), trimmers 2 (1 death), wiremen 2 (0 death), boy servant 1 (fatal), naval apprentice 1 (fatal), and cook's mate 1 (recovery).

(2) REMARKS ON SOME CLINICAL ASPECTS.

Onset.—Usually the initial symptoms are malaise, fever, headache, vomiting, and progressive increase of nervous symptoms, so that within 24 hours the condition is highly suggestive. In some cases the onset is more gradual with somewhat indefinite symptoms lasting several days. In others it is startlingly acute; thus in 2 cases it was maniacal, in 2 convulsions were the first sign, in 5 (3 fatal) the first indication of illness was fainting, and in 4 instances (2 fatal) the patient was found unconscious. Death in this apoplectiform mode of onset seems to be the probable explanation of the following cases:—

A man, aged 40, who went to bed at 7·45 P.M. feeling ill, but saying he would be all right next morning, was found dead in his hammock at 6 A.M. A boy at Shotley, aged 15, complained at 9 P.M. of slight sore-throat, for which he did not seek medical treatment; at 3.30 A.M. next day he was found dead. In these two cases the diagnosis was made from examination of the cerebro-spinal fluid after death.

Among 247 cases of cerebro-spinal fever in the second and third years of the war 12, or 5 per cent., had this form of onset and 6 of them proved fatal. The initial shock may be so considerable that for a time the temperature may be normal, or below normal, though it rises in a few hours; this was noted in 6 cases (3 fatal); one of these patients was unconscious when first seen, and in another who was operated upon for a diagnosed gastric ulcer perforation, and found to have a normal abdomen, lumbar puncture was at once performed at the suggestion of the anæsthetist, Temporary Fleet-Surgeon C. W. Morris, and turbid fluid containing meningococci obtained. Transfer to hospital may be followed by alarming collapse; one patient died in the ambulance and another a few hours after admission. Vomiting and diarrhœa are common at the onset, and in rare instances, 4 (3 fatal) were accompanied by so much abdominal pain as to imitate acute abdominal disease.

When the onset is gradual and preceded by catarrh it may be difficult to decide whether the meningococcic invasion is superimposed on an ordinary influenza or catarrh or whether the "catarrh" is the commencement of the disease. In 3 cases signs of meningitis appeared six days after the onset of rubella, in one instance 12 days after admission to hospital for chicken-pox, in two patients while in hospital with bronchitis and suspected pulmonary tuberculosis respectively, and in another case the day after discharge for bronchitis. The liability of new entries to be attacked, which is usually explained as due to diminution of their resistance by the trials incident to the change from civilian life, was shown by the occurrence of the disease within three weeks of joining the service in 31, or 21·7 per cent., of the 143 cases; one of these, a man aged 40, who had left the service 17 years before he was called up again, was found dead in his hammock. The average age of the other 30 cases was 19·3 years. Many of these new entries had been vaccinated shortly after joining. The mortality of the 31 cases, 10 (32 per cent.) is below that (36·2 per cent.) of the 143 cases. These various factors would favour systemic invasion by meningococci.

Rashes due to cerebro-spinal fever were recorded in 86, or 60 per cent., out of the 143 cases. The characteristic rash is hæmorrhagic. It may come out rapidly and progressively increase in extent and size, especially in the fulminating cases, so that, though there is no rash when first seen, a few hours later it is well out. In other cases there is first an erythema, macular or blotchy, or a rose spot eruption which subsequently becomes petechial or hæmorrhagic. The rash may not present more than one stage; it may be purpuric from the start or may not advance beyond the erythematous stage. The cases in which the rash has become hæmorrhagic are entered as such, and only those which remained erythematous, macular, or blotchy are so classified. The erythema has been described as a premeningitic rash [2] and as transient; this is probably why it is so seldom recorded. Out of the 86 cases 70 were described as hæmorrhagic, 10 as mottled, blotchy, or erythematous, and 5 as rose spots.

In one instance ulceration occurred in the larger purpuric patches, a very rarely recorded complication; cases have been reported by Bovaird,[3] Robb,[4] and Elliott and Kaye[5] (complicated by trench feet); all the four patients recovered.

Out of the 86 cases 36, or 43 per cent., proved fatal, as compared with the mortality of 36·2 per cent. for all the 143 cases. As is well known, the fulminant and most acute cases are especially prone to have a hæmorrhagic rash; out of the 28 cases fatal during the first week of the disease 22, or 78·6 per cent., had a rash, all the 5 cases fatal during the first 24 hours of the disease showing it; while out of the 24 cases fatal later than the end of the first week 14, or 58·3 per cent., had a rash. Among 410 cases of cerebro-spinal fever with complete notes in the Navy during the war rashes were noted in 239, or 58·2 per cent., with a mortality of 105, or 43·9 per cent., practically the same as that (43·4) of the total 410 cases.

Other hæmorrhages: In 2 cases sub-conjunctival hæmorrhages were associated with purpura. In one case (fatal) hæmaturia coincided with a purpuric eruption. Epistaxis was noted in 3 cases (1 fatal); in 2 it occurred while a purpuric eruption was out (1 fatal); in the other 12 days after the rash.

In fatal cases with a recent purpuric rash necropsy commonly showed subpericardial, subpleural, and subperitoneal hæmorrhages. In a case fatal on the third day the adrenals were intensely hæmorrhagic, and there were extravasations in the substance of the spleen, but no cutaneous hæmorrhages.

Herpes labialis was noted in 35, or 24·4 per cent., of the 143 cases. In one instance the eruption involved the external ear. Herpes generally appeared on the fourth (12 cases) or fifth day (10 cases) of the disease; in two instances herpes and a serum rash occurred together on the eighth and tenth days of the disease. Among the 35 cases 23, or 65·4 per cent., showed also an initial rash, and in one case they appeared on the same day; but usually the herpes came out three or four days after the rash. Eight cases showed an initial rash, herpes, and a serum rash; and 10 cases had herpes and a serum rash. In one case labial herpes on the sixth day of the disease occurred two days after an intramuscular injection of soamin 3 gr. Of the 35 cases 5, or 14·3 per cent., proved fatal; this mortality is very much lower than that (36·2 per cent.) of the total 143 cases, thus agreeing with the belief that herpes in cerebro-spinal fever is a good prognostic. No fulminating case had herpes, thus contrasting with the hæmorrhagic rash; the 5 cases proved fatal on the eighth, twelfth, fifteenth, fifty-seventh, and sixty-seventh days of the disease. Out of the 410 cases of cerebro-spinal fever during the first three years of the war herpes was noted in 91, or 22·2 per cent. Netter[6] finds that among cases in France labial herpes occurs in a third of the cases, and is commoner than purpura. As has been shown above, purpura has been more than twice as frequent as herpes in the Navy during the war.

Rarer manifestations and complications.—Ocular symptoms. Photophobia, a very early event, was noted in 11 cases; out of 410 cases of cerebro-spinal fever during the first three years of the war 42, or 10·2 per cent., had photophobia. Conjunctivitis was reported in 10 instances; usually it occurred at, or shortly after, the onset, but in one case it was observed on the twelfth day (after the intramuscular injection of 6 gr. of soamin), and in another on the thirtieth day of the disease. Out of the 410 cases it was noted in 24, or 5·8 per cent. Unilateral panophthalmitis in 2 cases necessitated excision of the globe, and in another case, fatal on the fourth day, there was iritis. During the three years of the war destruction in the eye occurred in 5 cases (in one bilateral). Strabismus occurred in 13 (6 deaths). Out of the 410 cases 42, or 10·2 per cent., had strabismus,

[2] Symonds: THE LANCET, 1917, vol. ii., p. 86.
[3] Bovaird, D.: Arch. Int. Med., Chicago, 1909, vol. iii., p. 267.
[4] Robb: Proc. Roy. Soc. Med. (Therap. and Pharm. Sect.), Lond., 1915, vol. ix., p. 5.
[5] Elliott and Kaye: Quart. Journ. Med., Oxford, 1916–17, vol. x., p. 263.
[6] Netter: Rev. de Méd., Paris, 1917, tome xxxv., p. 133.

and of these, 23, or 54·7 per cent., proved fatal. Ptosis was observed in 5 cases (3 deaths). Out of the 410 cases 15, or 3·6 per cent., had ptosis, and of these, 11, or 73·3 per cent., proved fatal. The prognosis, therefore, appears to be worse in cases with ptosis than in those with strabismus. Nystagmus was reported in 5 cases (2 deaths); of the 3 that recovered one had nerve deafness. Out of the 410 cases, nystagmus was mentioned in 11, or 2·6 per cent. Optic neuritis was detected in 4 (one death), being early in 2; but few cases were examined.

Nervous symptoms.—Hemiplegia occurred in one case, and after death softening of the internal capsule was found. Out of 410 cases during the three years of the war hemiplegia was noted in 11, or 2·6 per cent. Aphasia and dysarthria each occurred in one case (both recoveries). Dysphagia was noted in 4 cases (2 deaths). Bulbar paralysis was recorded in one instance the day before death. Deafness was recorded in 9 cases, usually nerve deafness; otorrhœa was observed in one case. General hyperæsthesia was recorded in 8 cases and delirium tremens in 2 cases (both recoveries); in the second year of the war delirium occurred in 2 cases (one fatal). The knee-jerks were absent in 12 cases (3 deaths) and the plantar response was extensor in 14 cases (6 deaths). In the first year of the war the extensor response was recorded in 11 cases; so out of 313 cases it was found in 25, or 8 per cent. No special significance could be attached to these alterations of the knee-jerk and plantar response.

Other clinical features.—Bronchitis was well marked in 8 cases (5 deaths) and was a grave complication. Pleurisy was noted in one case only (recovery). Mitral incompetence was diagnosed in 5 cases (all recovered), as compared with 5 cases (one death) in the second year of the war. Pericarditis appeared in one case; out of the 410 cases during the three years of the war it was noted in 7 (3 deaths). Albuminuria was noted in 5 cases (one death), in one instance coinciding with a serum rash and œdema of the genitals. Polyuria was observed in one case and pyuria in 2 cases. One case (recovery) had temporary glycosuria and albuminuria on the second day of the disease. In 3 cases furunculosis was troublesome during convalescence. Inflammation of the right parotid (non-suppurative) on the sixth day of the disease was noted in one case (recovery).

Arthritis was noted in 8 cases (one fatal) on the third, fourth, fifth, fifth, seventh, eighth, ninth, and thirteenth days, affecting the knee (3), knees, ankles, and wrists, wrists and ankles, elbow, ankle and finger, and several joints. In 2 of the cases there was iridocyclitis. Seven of the 8 cases had purpura; and in connexion with the view that arthritis when associated with purpura is due to hæmorrhage into the synovial membrane it may be mentioned that in another case the onset of purpura was accompanied by joint pains. According to Netter, meningococcic purpura is prone to be associated with arthritis, iridocyclitis, and malignant endocarditis; among 410 cases of cerebro-spinal fever in the Navy during the first three years of the war there was one case in which recent endocarditis was found at the necropsy. In one case only was aspiration necessary, the pus being sterile. In one case effusion into the knees, ankles, and wrists occurred on the fifth day of the disease, and on the eleventh and twenty-second days there were serum rashes, the second of which was accompanied by arthralgia. In this case and in the case with arthritis of the wrists and ankles there was panophthalmitis subsequently requiring excision. The case with arthritis of the elbow was left with weakness of the extensor muscles of the wrist. Usually the effusion was transient, but in one instance the knee-joint contained fluid for six weeks. Among 410 cases of cerebro-spinal fever in the Navy during the first three years of the war there were 20 cases of arthritis, or 4·8 per cent.; 5, or 25 per cent., of these were in fatal cases.

Orchitis or epididymitis without gonorrhœa occurred in 5 cases, on the sixth, eighth, ninth, eleventh, and twelfth days of the disease. In 3 cases it occurred at the same time as a serum rash, and in one of these there was concomitant œdema of the genitals, an association mentioned by Goodall[7]; the other 2 cases did not show a serum rash. In 2 cases the orchitis or epididymitis was bilateral; in the other 3 it was unilateral. Two of the 5 cases had previously had herpes. None of the cases proved fatal. Among the 410 cases of cerebro-spinal fever in the Navy during the first three years of the war orchitis or epididymitis without evidence of gonorrhœa was noted in 8 cases, or 1·95 per cent. This is a recognised complication of cerebro-spinal fever, and 2 cases showing synovitis and epididymitis, thus recalling the morphological resemblance of the meningococcus and gonococcus, have been recorded (Eschbach and Lacaze[8]).

In 3 cases, all fatal, secondary or double infection of the meninges occurred; in one instance the second lumbar puncture showed streptococci as well as meningococci which were in pure culture in the first lumbar puncture fluid; in the 2 other cases the additional infection was found at the necropsy; in one tuberculous meningitis (fatal on the eighteenth day) and in the other, fatal on Dec. 14th, 1916 (eleventh day), pneumococcic. In the second year of the war there was one case of mixed meningococcic and pneumococcic infection without any obvious focus (detected at the first puncture, recovery) and 2 of streptococcic invasion (otitic, and infection from lumbar puncture wound, both fatal). So out of 247 cases secondary or double infections occurred in 6, or 2 per cent.; the case of combined tuberculous and meningococcic meningitis raises the question which was primary, for although the onset with a rash becoming hæmorrhagic was that of meningococcic infection, this may have been favoured by the presence of latent tuberculous meningitis; of this rare combination Bériel and Durand[9] accepted 8 cases only. The date of the pneumococcic case is of interest in connexion with Netter and Salanier's[10] 22 cases of secondary pneumococcic infection of meningococcic meningitis treated by serum during the first four months of 1917 when, from the increase of primary pneumococcic meningitis since December, 1916, the virulence of the pneumococcus was presumably intensified.

Diagnosis.—Only cases proved to be meningococcic by bacteriological examination of the cerebro-spinal fluid have been included in these 143 cases. Some criterion must be employed so as to exclude cases of meningitis due to undetermined factors and cases of meningism, and this bacteriological test is obviously the most satisfactory. That cases of meningococcic meningitis may thus be ruled out is shown by the occasional failure to find meningococci in the cerebro-spinal fluid during life and its subsequent discovery at the necropsy. But the statistical error thus introduced is probably much less than that which would result from the inclusion of cases diagnosed from the clinical manifestations, and in the latter event it would be difficult to know where to draw the line, as no one sign or symptom is pathognomonic of meningococcic as opposed to other forms of meningitis. Cases with meningeal symptoms and meningococci in the nasopharynx but not in the cerebro-spinal fluid, though possibly genuine cases, and therefore demanding prompt serum treatment, have not been included in the 143 cases, as they may have been examples of carriers with meningism due to other causes.

The diagnosis in the possibly abortive cases arising in association with cases of proved meningococcic meningitis is difficult. Groups of such cases occurred in the boy-training establishments at Shotley (July–August, 1916) and in the *Powerful* (December, 1916); the Shotley cases presented meningitic symptoms, but among the *Powerful* cases febrile purpura without meningeal manifestations was prominent, thus suggesting transient meningococcæmia. Netter, in his account of meningococcic purpura without meningococci in the cerebro-spinal fluid, states that the diagnosis can be made by a blood culture and by the discovery of meningococci in the contents of bullæ produced by friction of the purpuric spots. But in the *Powerful* cases these tests were negative. Such cases recover. For the purposes of this analysis bacteriological proof of meningococcic infection has been demanded, but in practice antimeningococcic serum should be given to probable cases pending the results of laboratory examination. A clear cerebro-spinal fluid at the first puncture does not exclude cerebro-spinal fever, and, on the other hand, a turbid fluid at the second puncture—serum having been given on the first occasion—is not evidence of infective meningitis, as the serum may cause a polymorphonuclear exudation. Cases with cerebro-spinal

[7] Goodall, E. W.: "System of Medicine" (Allbutt and Rolleston), 1911, vol. ix., p. 114.

[8] Eschbach et Lacaze: Bull. et Mém. Soc. Méd. des Hôp. de Paris, 1915, 3 sér., tome xxxix., p. 1024.

[9] Bériel et Durand: Lyon méd., 1913, tome cxxi., p. 913.

[10] Netter et Salanier: Bull. et Mém. Soc. Méd. des Hôp. de Paris, 1917, 3 sér., tome xli., pp. 789–794.

fluid turbid from predominance of polymorphonuclear leucocytes on the first tapping, but without demonstrable meningococci, present great difficulty; they should, of course, be treated by antimeningococcic serum, and their recovery is evidence in favour of a meningococcic origin, not only from the point of view of this therapeutic test but also because other forms of polymorphonuclear meningitis usually prove fatal. The bacteriological criterion obviously enables a more accurate view to be taken of the effects of serum treatment; and having adopted this standard, it is unnecessary to discuss the differential diagnosis from other forms of meningitis and from the meningism so comparatively common in association with acute infections.

(3) SUMMARY OF THE RESULTS OF TREATMENT.

Six out of the 143 cases were recognised after death only and were not treated for the disease; 9 cases (4 fatal) had lumbar puncture only; and 11 cases in addition to lumbar puncture had intramuscular injections of soamin (2 cases, both fatal), quinine 20 gr. (one case, recovery), or both (8 cases, 2 deaths). So that out of 26 cases which did not have serum treatment 14, or 53·8 per cent., proved fatal. In the first year of the war when the serum available appeared to be inert the mortality of the 170 cases was 90, or 52·6 per cent., or much the same. Among the 117 cases treated by some form of serum during the third year of the war the mortality was 38, or 32·4 per cent., or almost the same as in the second year of the war—namely, 30 deaths, or 31·6 per cent., out of 95 cases treated by serum. During these two years, therefore, 212 cases were treated by serum with a mortality of 68, or 32 per cent. This forms a striking contrast to the mortality of 64, or 61 per cent., among 105 cases treated by serum during the first year of the war when Flexner's serum was not available. During the second and third years of the war 143 cases received Flexner's serum alone or in combination with other serums, and of these 41, or 28·6 per cent., proved fatal, the mortality of the 109 cases treated by Flexner's serum alone being 30, or 27·5 per cent., and of the 34 cases treated by Flexner's serum in combination with other serums 11, or 32·3 per cent. During the third year of the war Flexner's serum was used in 104 out of the 117 cases treated by serum. In 82 cases it was the only serum employed with a mortality of 24, or 29·2 per cent. Among 22 cases in which it was employed in combination with other serums (Gordon's, Lister Institute, Mulford, and Burroughs, Wellcome and Co.'s) the mortality was 8, or 36·4 per cent., and among the 13 cases treated by serums other than Flexner's there were 6, or 46·3 per cent., deaths. These cases were given Gordon's serums (7 cases, 3 deaths), Toronto Laboratory's (2 cases, recoveries), Mulford's (one case, fatal), the Lister Institute's multivalent (one case, recovery), Lister Institute's multivalent and Pasteur Institute's multivalent (one case, fatal), and in one case (fatal) the brand of serum could not be elicited. Flexner's serum therefore appeared to give the best results.

Out of the 117 cases 96, or 82 per cent., received the serum intrathecally within the first three days of the disease with a mortality of 31 cases, or 32 per cent., which is lower than that of the 17 cases commencing serum treatment between the fourth and seventh days of the disease—namely, 7, or 41 per cent. But among the 4 cases in which serum treatment was begun after the seventh day there were no deaths. During the second and third years of the war 212 cases were treated by serum, and the combined figures give much the same result as in the third year of the war. The statistics of the first year of the war have not been utilised as the serums then in use appeared to be inert.

Day on which serum treatment was begun.	Cases.	Deaths.	Recoveries.
1st to 3rd day...	170	53 or 31·2 per cent.	117 or 68·8 per cent.
4th to 7th day...	32	12 ,, 37·5 ,,	20 ,, 62·5 ,,
Later than 7th day... ...	10	3 ,, 30 ,,	7 ,, 70 ,,
	212	68 ,, 32 ,,	144 ,, 68 ,,

The number of cases treated late by serum is too small to throw doubt on Flexner's statistical evidence, based on analysis of 1211 cases, that the mortality rises progressively with delay in beginning the serum treatment; but it is obvious that cases which survive without serum treatment until after the seventh day are not fulminating, and probably some are so mild as to recover spontaneously.[11]

The number of occasions on which serum was given intrathecally varied from 1 to 14. The best results were obtained in 88 cases receiving from two to six injections—namely, a mortality of 23, or 26 per cent.; out of the 15 cases that had seven or more injections 8, or 53 per cent., proved fatal.

Fourteen cases received one injection only of serum and 7 proved fatal, 5 being fulminating cases; 27 received two doses (6 deaths); 20 three doses (4 deaths); 16 four doses (6 deaths); 16 five doses (5 deaths); 9 six doses (2 deaths); 7 seven doses (4 deaths); 1 eight doses (recovery); 1 nine (fatal); 2 ten doses (1 death); 2 eleven doses (1 death); 1 twelve doses (fatal); and 1 case fourteen doses (recovery). Lumbar puncture was performed 27 times in a fatal case which received ten intrathecal injections and 26 times in a case that recovered and also had ten injections. The case tapped on 27 occasions had a hernia cerebri from an old injury which swelled up when the intracranial pressure rose.

The following figures bear on the question of the effect exerted by hypodermic or intramuscular injection of the serum; 36 cases received serum hypodermically or intramuscularly, but as they all had serum intrathecally as well there are no data bearing on the effect of the hypodermic or intramuscular method alone.[12] Out of these 36 cases 14, or 39 per cent., proved fatal, whereas of the 81 cases treated solely by intrathecal injection of serum 24, or 29·6 per cent., proved fatal. If the corresponding figures for the second year of the war are added, it is seen that out of 59 cases receiving hypodermic or intramuscular in addition to intrathecal injections of serum 21, or 35·6 per cent., proved fatal, whereas out of 141 cases treated by intrathecal injections alone 42, or 29·8 per cent., were fatal. (The figures for the first year of the war are not utilised, as the serum then employed appeared to be inert.) There is therefore no evidence that hypodermic or intramuscular injection enhances the effect of the intrathecal injection of serum; it would not be fair to draw any further conclusions, as in some cases the hypodermic or intramuscular method was probably employed because of the severity of the patient's condition.

Intravenous, in addition to intrathecal and hypodermic, injection of serum was tried in 2 cases (one fatal).

The quantity of serum given varied very much; the largest amount given intrathecally was 240 c.cm. in a fatal case, but a case that recovered received 210 c.cm. intrathecally. In 77 cases that recovered the amounts given, which in some cases include hypodermic or intramuscular injections of serum, may be arranged as follows:—

Received	30 c.cm. or less...	11 cases.
,,	between 30 and 60 c.cm. ...	30 ,,
,,	,, 60 ,, 100 ,, ...	17 ,,
,,	,, 100 ,, 200 ,, ...	16 ,,
,,	over 200 c.cm.	3 ,,

The extremes were 15 and 250 c.cm.

In addition to Gordon's serum intrathecally two cases were given intravenous injections of tartrate of antimony; one case had three such injections and proved fatal, the other had one such injection and recovered. A stock vaccine was given to one case only (fatal).

Serum rashes, urticarial, erythematous, morbilliform, or, in a very few instances, scarlatiniform, occurred in 58, or 60 per cent., out of the 96 cases treated by serum and surviving for more than ten days, and on an average appeared ten days after the first injection of serum. Out of the 241 cases given serum and surviving for ten days or more during the first three years of the war 99, or 41 per cent., had a serum rash. During the second year of the war serum rashes, which were noted in 30 per cent. of the 74 cases given serum and surviving for more than ten days, were found to be specially

[11] Dopter in his recent book (Diagnostic et Traitement de Méningite Cérébro-spinale, p. 52, 1918) gives the mortality of his cases treated before the third day as 8·2 per cent., between the fourth and seventh days 14 per cent., and after the first week 2·4 per cent. only, thus agreeing roughly with the proportions in the naval cases and differing from those of Flexner.

[12] Flexner insists that, as very little serum from the blood reaches the inflamed meninges, it is useless to inject it subcutaneously or intravenously in the expectation that it will exert any influence on the meningococci in the subarachnoid space. ("Mode of Infection, Means of Prevention, and Specific Treatment of Epidemic Meningitis," p. 35, 1917, Rockefeller Institute for Medical Research.)

connected with the use of Flexner's and of Burroughs, Wellcome and Co.'s serums. During the past year this was even more obvious as regards Flexner's serum, for out of the 58 cases of serum rash 56 received this brand of serum, and the rise in the incidence of serum rashes from 30 to 60 per cent. is coincident with the increased use of Flexner's serum —namely, from 39, or 41 per cent., of the 95 cases treated by serum during the second year of the war to 104, or 89 per cent., of the 117 treated by serum during the third year of the war. The serum rash is a non-specific protein reaction due to a foreign protein, and it might be suggested that the reason why Flexner's serum is, as shown below, so remarkably prone to produce this reaction in British subjects is that it is obtained from horses in America.

Out of the 82 cases receiving Flexner's serum only there were 51, or 62 per cent., with rashes; but out of the 82 cases 11 died before the occurrence of a serum rash could be excluded, so that out of the 71 cases which recovered (58) or (if fatal) survived for more than ten days (13 cases) 51, or 71 per cent., had a serum rash. Out of the 58 cases that recovered there was a serum rash in 45, or 77·6 per cent., and out of the 13 fatal cases surviving more than ten days in 6, or 46 per cent. These figures, though small, point to the lower incidence of a serum rash in the graver cases. Out of 22 cases given Flexner's and other brands of serum 17 recovered or survived more than ten days, and 5, or 30 per cent., of these had a rash; thus the percentage incidence of serum disease was less than in cases treated solely by Flexner's serum. Out of 13 cases treated by serums other than Flexner's 8 recovered or lived more than ten days, and of these 2, or 25 per cent., had a serum rash.

Flexner's serum was given hypodermically as well as intrathecally in a number of cases; and out of 26 of these cases that recovered or (if fatal) survived for more than ten days a serum rash was noted in 11, or 42 per cent.; whereas out of 61 cases which received Flexner's serum by the intrathecal route only and recovered or (if fatal) survived for more than ten days 43, or 70 per cent., manifested a serum rash. As far as these figures go, the serum rash appears to be commoner after intrathecal injection than after the combined intrathecal and hypodermic injection. Out of Currie's [13] 50 cases of cerebro-spinal fever treated mainly by subcutaneous injection of serum (36 cases subcutaneous injection only, 13 cases with one intrathecal and the remaining injections subcutaneously, and in one case with one intrathecal and one intravenous and the remaining injections subcutaneously) 29, or 58 per cent., had rashes. Comparison of Currie's and the 61 naval cases (with 70 per cent. of rashes) confirms Flexner's [14] remark that possibly the manifestations of serum disease are more frequent after this intrathecal than after the subcutaneous method of injection employed in serum-therapy generally. These, however, are small and selected groups of figures and do not justify a final conclusion. Goodall [15] says that analysis of a large number of cases shows that about a third of the patients receiving ordinary hypodermic injections of serum have a rash; but some statistics show a higher percentage,[16] and among 37,277 cases of diphtheria injected with serum at the Metropolitan Asylums Board Hospital (1898–1903) the incidence of rashes was 44 per cent., or rather more than that (41 per cent.) among the 241 cases of cerebro-spinal fever given serum during the first three years of the war. It cannot, therefore, be said that the incidence of serum rashes is proved to be higher after the intrathecal than after the ordinary method of injecting serum.

In cases treated by subcutaneous as well as intrathecal injection of serum the serum rash may begin around the site of the subcutaneous puncture and subsequently become general.

Quite commonly a serum rash appears, fades, and about two days later again becomes prominent; the first may be erythematous and the second urticarial and extremely irritating. These may be regarded as phases of the same reaction. In rare instances two serum rashes appear at such an interval as to justify the term *double serum rash* and to suggest two separate reactions, which might be supposed to be the result of injections on different days; a number of Currie's cases also bear this interpretation; this, however, as shown by the second of the following cases, is not universally true, and the occurrence of two or three distinct rashes after a single injection of serum is now thought to be due to the successive appearance, at different time intervals, of sensitiveness to the different proteins—euglobulin, pseudo-globulin, and albumin—present in horse serum (Dale and Hartley [17]).

After intrathecal injections on the third, fourth, and sixth days of the disease there was an erythema on the eighth day, which faded on the ninth and reappeared on the eleventh day. On the eighteenth day there was a recurrence of the rash. In another case a double serum rash followed the administration of serum on one day only, the second day of the disease, when intrathecal, intravenous, and hypodermic injections were given; serum rashes appeared on the tenth and on the twenty-fifth days.

There is another category of double serum rashes: when in a chronic case an ordinary serum rash occurs, and subsequently after a period during which no serum has been given and anaphylaxis has developed, a further injection is given with the rapid appearance of a rash.

A man had a serum rash seven days after he first had serum. Thirty-six days later, no serum having been injected for 20 days, a further injection was given, followed next day by an immediate serum rash without constitutional symptoms of anaphylaxis. In a somewhat similar case there were serious constitutional symptoms and a hæmorrhagic rash (*vide infra*).

The quantity of serum administered had very little influence in inducing a serum rash; this appears to be contrary to the general experience. Among 58 cases that had Flexner's serum only and recovered—

23	received	less than 50 c.cm. of serum, and 18, or 78 per cent., had a rash.
24	,,	more than 50 c.cm. and less than 100 c.cm., and 19, or 79 per cent., had a rash.
8	,,	more than 100 c.cm. and less than 150 c.cm., and 7, or 87 per cent., had a rash.
3	,,	more than 150 c.cm., and 2, or 67 per cent., had a rash.

It was pointed out by Currie [18] that an injection of antidiphtheritic serum just before a serum rash due to a previous injection might be expected may determine the appearance of a rash which otherwise would not have developed. Examination of the notes does not show that this sequence is established in cerebro-spinal fever. It is true that in a few cases lumbar puncture and the injection of serum have been performed the day before the rash appeared, there having been a previous interval of some days without the administration of serum. But such cases are perhaps more satisfactorily explained by the view that the symptoms of cerebral pressure which led to the lumbar puncture and the injection of serum were premonitory of the serum rash (*vide infra*).

In 3 cases œdema of the scrotum accompanied the serum rash, and in one of these there was transient albuminuria. In a fourth case the eyelids were œdematous. In 5 cases pains in the joints accompanied or followed the serum rash, and in one of these there was a double serum rash (on the eleventh and twenty-second days after the first injection), and each eruption was associated with arthralgia. In 6 cases the serum rash was followed, usually after an interval of four days, by synovial effusion, commonly of the knees or wrists, sometimes but not always painful. This well-known association of erythematous eruptions and joint symptoms suggests a similar change in both situations. In one case a painless effusion into the left knee-joint occurred seven days after the first injection of serum, although there was no rash. The rash may be accompanied by fever and enlargement of the lymphatic glands.

In 9, or 15·5 per cent., out of the 58 cases the serum rash was preceded or accompanied by a recrudescence of meningeal symptoms which were relieved by lumbar puncture. This manifestation of serum disease, well described by Netter and Debré,[19] appears to be peculiar to the intrathecal injection, and its mechanism may perhaps be elucidated by analogy. The liability of the mucous membranes originally attacked by diphtheria to swell at the time of the subsequent serum reaction may be shared by the

[13] Currie, J. R.: Journ. Hyg., Cambridge, 1908, vol. viii., p. 457.
[14] Flexner, S.: Loc. cit., p. 42, 1917.
[15] Goodall, E. W.: "System of Medicine" (Allbutt and Rolleston), 1911, vol. ix., p. 113.
[16] Notably those of J. D. Rolleston (Practitioner, 1905, vol. lxxiv., p. 660) from 67 to 81 per cent.
[17] H. H. Dale and P. Hartley: Biochem. Journ., Cambridge, 1916, vol. x., p. 408.
[18] J. R. Currie: Journ. Hyg., Cambridge, 1907, vol. vii., p. 35.
[19] Netter et Debré: "La Méningite Cérébro-spinale," p. 264, Paris, 1911.

meninges in cerebro-spinal fever; and it may be suggested that the meninges show a change corresponding to the rash and œdema which sometimes begin around the site of a hypodermic injection of serum. This form of meningeal irritation or meningism can be distinguished from a true relapse of meningococcic infection by examination of the cerebro-spinal fluid for the presence of meningococci, and also for the normal reducing agent (glucose) which is absent in a genuine relapse but present in the meningism of serum disease (Reveillet, Nové-Josserand, and Langeron).[20] This latter test, which can be done in a few minutes, and so is useful in deciding whether at once to give serum intrathecally (relapse) or to withhold it (meningism), has been used by Staff Surgeon L. Warren in the *Agadir*, and by Dr. C. Ker[21] at the City Hospital, Edinburgh, where some naval ratings have been treated.

Out of the 58 cases showing serum rashes 7, or 12 per cent., proved fatal. The average duration of these fatal cases was 26 days, the extremes being 15 days (in 2 cases) and 56 days (the next longest case lasting 31 days). Nineteen cases had both an initial rash and a serum rash (double in three instances), 10 cases both herpes labialis and a serum rash, and 8 cases an initial rash, herpes, and a serum rash (double in two instances); in those cases the skin was presumably prone to react in a special degree.

Grave accidents due to lumbar puncture and the intrathecal injection of serum were rare, and should not occur if the obvious causes be avoided. The cases may be divided into those (1) due to increased intracranial pressure:

A man on the third day of the disease had lumbar puncture for the third time, 5 c.cm. of fluid not under pressure being removed; 40 c.cm. of serum was given and respiration stopped; artificial respiration was followed by improvement, but he died five hours later. At the necropsy the lateral ventricles were distended with purulent fluid. A man on the second day of the disease was lumbar punctured for the first time and 30 c.cm. of turbid fluid removed; 20 c.cm. of serum was given intrathecally and he collapsed with respirations of 10 and a pulse of 120 per minute. Artificial respiration was followed by recovery. During the second year of the war there were three cases of this nature.

(2) due to anaphylaxis:

On the forty-eighth day of the disease, not having had any serum for 27 days, a man had an intrathecal injection of 20 c.cm.; seven hours later he vomited, had a purpuric rash, and was gravely ill. Next day the rash had faded, but the right knee was full of fluid. He died seven days after the injection.

(3) due to infection through the lumbar punctures:

After 13 lumbar punctures and the intrathecal injection of 240 c.cm. of serum, a man was on the twenty-ninth day of the disease found to have a swelling resembling a hæmatoma over the lumbar spine; incision next day gave exit to blood-stained fluid and some débris. Death occurred suddenly next day. As there was no necropsy the nature of the infection was not determined.

In one case lumbar puncture without injection of serum was followed by pain and tenderness in the course of the left sciatic nerve and some wasting of the limb.

This paper is derived from the notes of cases occurring under various medical officers, and of course would have been quite impossible without their courteous coöperation. In addition to those incidentally mentioned, I beg to express my sincere thanks to Surgeon-General W. W. Pryn, C.B.; Deputy Surgeons-General R. Hill, C.V.O., P.M.O. of the Grand Fleet, W. Bett, M.V.O.; Fleet-Surgeons A. MacLean, D.S.O., W. H. S. Stalkartt, A. R. Bankart, C.V.O., T. T. Jeans, H. S. Burniston, W. MacLeod, J. A. Campbell, R. M. Richards, W. L. Martin; Staff-Surgeon G. P. Adshead; Surgeon J. R. Adam; Temporary Surgeons J. P. Berry, B. A. Playne, D.S.O., E. J. Tongue, and A. Viney.

[20] Reveillet, Nové-Josserand, et Langeron: Journ. de Physiol. et Path. Gén., Paris, 1914-15, tome xvi., p. 1080.

[21] Vide also THE LANCET, 1917, vol. ii., p. 822.

BRADFORD HOSPITAL SUPERINTENDENT. — The Health Committee of the Bradford Corporation have tendered to Dr. J. T. Kitchin their congratulations on his having completed 21 years' service as medical superintendent of Leeds-road hospital, and have expressed their appreciation of his attention, efficiency, and tact.

THE GROUPING OF MENINGOCOCCI INTO "TYPES."

BY P. FILDES, M.B., B.C. CANTAB.,
ASSISTANT BACTERIOLOGIST TO THE LONDON HOSPITAL; HON. STAFF-SURGEON, R.N.V.R.
(*Working on behalf of the Medical Research Committee*)
AND
S. L. BAKER, M.R.C.S., L.R.C.P. LOND.,
TEMPORARY SURGEON, R.N.
(*From the Laboratory, Royal Naval Hospital, Haslar.*)

Previous Investigations.

UPON the introduction of agglutination tests for the differentiation of meningococci from other Gram-negative cocci it was found that a great variation existed among different strains obtained from the cerebro-spinal fluid. This reaction was therefore looked upon as an inconstant characteristic of the coccus, and thus was of less value for identification than cultural and fermentation tests.

On the other hand, some workers looked upon the agglutination of meningococci as a fairly constant phenomenon and tended to designate cocci which failed with their sera as "pseudo-meningococci." There appeared to be an assumption that such cocci were not capable of producing cerebro-spinal fever. There is little doubt that much of the confusion was due to the investigation of cocci cultivated from the nasopharynx and to the necessity for determining the relation of these cocci to cerebro-spinal fluid strains.

Dopter was the first to make a definite division of meningococci when he showed that certain inagglutinable strains which he had isolated from the nasopharynx were really meningococci in the sense that they were capable of producing cerebro-spinal fever. He named these "parameningococci," and found that they were agglutinated by a "parameningococcus" serum. Dopter and his co-workers then showed that there were varieties among "parameningococci" demonstrable by agglutination, and confirmed by absorption of agglutinin tests. They divided in this way the "parameningococci" into subgroups α, β, and γ.

Gordon and Murray carried out a systematic examination of a number of cerebro-spinal fluid meningococci, and by preparing monovalent sera from some of these strains were able to show that all of the strains met with were agglutinable by one or two of four monovalent sera. By absorption of agglutinin tests they then demonstrated that when a coccus is agglutinated by two sera one of these reactions is due to group action in the serum, and thus all cocci dealt with really fell into one of four relatively sharply demarcated, but related, groups—namely, I., II., III., and IV.

Gordon and his associates have since had the opportunity of examining a large number of cases, and practically all of these have been shown to conform to this classification into four types. Many of these cases have been proved by Tulloch by means of absorption of agglutinin tests, and only three strains in 107 could not be placed in one of the 4 groups. The majority of strains belonged to Type I. and Type II.

Griffith and Scott have examined a number of strains of meningococci, and have been able to divide them into groups according to their serological reactions, but only into two main groups, which are not sharply defined, as maintained by Gordon, but are linked together by intermediate and indefinite varieties.

Arkwright also has been able to divide a number of cerebro-spinal fluid strains into two main groups linked together by a few intermediate strains. One group he considers to correspond mainly to "meningococci," while the other group consists mainly of "parameningococci." Similarly, Ellis has demonstrated two groups among the cocci examined by him. His groups are, however, sharply defined, and all of his 46 strains fall into one or other. His Group II corresponded with the "parameningococcus."

Divergent Views on Classification.

It would appear that all investigators agree that there is serological evidence of two main groups of meningococci, while most associate these with the meningococcus and

parameningococcus. This classification is generally considered to be more or less artificial. The groups are not sharply divided, and numerous intermediate strains are found. Gordon, on the other hand, holds that the two main groups (Types I. and II.) are sharply defined, while the intermediate types are also members of well-defined subgroups (Types III. and IV.). He is of opinion that practically all meningococci obtained from the cerebro-spinal fluid in this country can be classified into one of his four groups, and therefore the vast majority of cocci which cannot be so classified are *not* meningococci in the sense that they are *not* capable of producing cerebro-spinal fever.

Gordon's work leads to important conclusions with regard to the identification of doubtful cocci in the throats of contacts, and, indeed, sets up a hard-and-fast diagnostic standard for the meningococcus, an organism which formerly was particularly indefinite in specific reactions. We therefore have applied his standards to all of our strains with methods and materials of our own, with a view to confirmation or otherwise. We are indebted to Colonel Gordon for the original samples of serum by means of which our own cocci were first identified, but otherwise our work has been quite independent of his.

The Grouping of Meningococci from the Cerebro-spinal Fluid by Means of Agglutination.

In Table I. is seen the result of carrying out quantitative agglutinations of each strain with monovalent sera corresponding to Gordon's Types I., II., III., and IV. Forty-six

TABLE I.—*Classification of Meningococci by Agglutination.*
Plus signs indicate complete agglutination.
(+) Incomplete agglutination.

Suspensions of cocci from c.s.f. No. of case.	Agglutinating sera. Type I. 1 in 100, 200, 400	Type II. 1 in 100, 200, 400	Type III. 1 in 100, 200, 400	Type IV. 1 in 100, 200, 400
4	+ + +	0 0 0	+ 0 0	0 0 0
6	+ + +	(+) 0 0	+ (+) 0	0 0 0
5	+ + (+)	(+) 0 0	+ 0 0	0 0 0
8	+ + (+)	0 0 0	+ 0 0	0 0 0
9	+ + +	0	0	0
343	+ + (+)	(+) 0 0	(+) 0 0	0 0 0
166	+ + +	0	+ 0 0	0
182	+ + (+)	0 0 0	+ (+) 0	0 0 0
437	+ + +	0 0 0	+ 0 0	0 0 0
469	+ + +	(+) 0 0	(+) 0 0	0 0 0
527	+ + (+)	0 0 0	+ 0 0	0 0 0
536	+ + +	(+) 0 0	+ 0 0	0 0 0
566	+ (+) 0	0 0 0	(+) 0 0	0 0 0
565	+ + 0	(+) 0 0	+ 0 0	0 0 0
633	+ +	0	+ (+) 0	0
687	+ + +	0 0 0	+ 0 0	0 0 0
696	+ + (+)	0 0 0	(+) 0 0	0 0 0
705	+ (+) 0	0 0 0	+ 0 0	0 0 0
769	+ + +	+ 0 0	+ 0 0	0 0 0
846	+ + +	+ 0 0	+ 0 0	0 0 0
863	+ + +	0 0 0	+ 0 0	0 0 0
1028	+ +	0	0	0
809	+ + +	0 0 0	+ 0 0	0 0 0
1058	+ (+) 0	0 0 0	0 0 0	0 0 0
286	0 0 0	+ + (+)	+ 0 0	0 0 0
344	0 0 0	+ + (+)	0 0 0	0 0 0
414	0	+ + (+)	0	0 0 0
468	0 0 0	+ (+) 0	0 0 0	0 0 0
568	0 0 0	+ + 0	(+) 0 0	0 0 0
632	0 0 0	+ + (+)	0 0 0	0 0 0
704	0 0 0	+ (+) 0	0 0 0	0 0 0
790	0 0 0	+ (+) 0	0 0 0	0 0 0
737	0 0 0	+ (+) 0	0 0 0	0 0 0
845	0 0 0	+ + 0	(+) 0 0	0 0 0
841	0 0	+ +	0 0	0 0 0
1	0 0	0 0	(+) 0	0 0
142	0 0 0	(+) 0 0	+ + +	0 0 0
206	0 0 0	0	+ 0 0	0
1118	0 0 0	(+) 0 0	+ + +	0 0 0
695	0 0 0	0 0 0	+ 0 0	0 0 0
225	0	0	0	+ + (+)
357	0 0 0	+ (+) 0	0 0 0	+ + 0
415	0 0 0	+ (+) 0	0 0 0	+ (+) 0
567	0 0 0	+ (+) 0	0 0 0	+ + (+)
619	0 0 0	+ + (+)	0 0 0	+ + (+)
949	0 0 0	+ + (+)	+ 0 0	+ + (+)

strains were examined, and these represent the whole of the strains isolated by us, without exception. Of these, 24 were agglutinated with Type I. serum and 22 were not in a dilution of 1 in 100. Six of these latter agglutinated with Type IV. serum and 16 did not. None of the strains which agglutinated with one of these sera agglutinated with the other. With these two sera, therefore, 30 of the 46 strains were clearly accounted for in Gordon's scheme. When the remaining 16 strains were tested 11 were found to agglutinate only or chiefly with Type II. serum, while 5 strains were found to agglutinate only or chiefly with Type III. serum.

Thus all of our cerebro-spinal strains could be classified with Gordon's 4 "type" sera, and none were found to fail to agglutinate. On the other hand, a study of the table will show that in most cases the classification rests largely upon a quantitative basis and that there is evidence of close relationship between groups. Thus Type I. cocci are constantly agglutinated by Type III. serum up to 1 in 100. Some of these cocci are also slightly affected by Type II. serum. Type IV. cocci are constantly agglutinated by Type II. serum, often as high as 1 in 200. Types II. and III. cocci are not affected by the other two sera.

From these results it would appear that Type III. is a coccus which produces a serum capable of agglutinating itself and Type I., and that Type II. serum is capable of agglutinating Types II. and IV. Types I. and IV. sera are more "specific" and contain less group agglutinins, since they have no effect upon the other types. Thus in general it may be said that there is evidence of close relationship between Types I. and III. and Types II. and IV., and, further, that Types I. and IV. are the more highly specialised members of each pair. If Types I. and III. are looked upon as Group A and Types IV. and II. as Group B, the two groups will be seen to be quite sharply divided, although, of course, related, and these may be, indeed, the two groups or types referred to by other authors.

Gordon, however, goes farther than other authors and claims that each of his four types is distinct, although it may be inferred from the group agglutinins that they are related. This claim he supports by subjecting the strains to absorption of agglutinin tests when he finds that each strain absorbs agglutinins for one only of his 4 types, and thus, whatever inferences may be drawn from the presence of group affinities, every coccus found in the cerebro-spinal fluid in these cases really belongs to one only of 4 relatively distinct groups.

We have also subjected all our available strains to absorption tests.

The Grouping of Meningococci from the Cerebro-spinal Fluid by Means of Absorption of Agglutinin.

In Table II. are given the results of absorbing each of the 4 "type" sera with the same series of meningococci as were included in the agglutination table. The agglutinating action of the absorbed serum is then compared with that of the unabsorbed, and the loss of agglutinating action or degree of absorption is indicated in the table by the number of *plus* signs.

It is seen that all cocci which agglutinated with Type I. serum absorbed Type I. agglutinins strongly. The agglutinins of other types, in particular of Type III., were not absorbed. A slight absorption of Type IV. agglutinins by No. 705 may be disregarded.

The cocci which agglutinated with Type II. serum and not with Type IV. absorbed Type II. agglutinins only. Unfortunately we were unable to test all of our few examples of Type III. cocci. Of the 3 examined 2 absorbed Type III. agglutinins only and one absorbed no agglutinins.

The cocci which agglutinated with Type IV. serum all absorbed Type IV. agglutinins fairly strongly.

Thus each, except one, of our strains of meningococci when tested by the absorption of agglutinin test fell into one only of the 4 groups of Gordon. These groups were sharply defined and no coccus, or perhaps only one, showed any tendency to lie in an intermediate position between any two of the 4 types.

Certain investigations have been carried out with the view of determining the nature of the outstanding coccus No. 695.

No. 695 was a fatal case of cerebro-spinal fever. The cerebro-spinal fluid contained pus and typical meningococci. These latter were isolated upon our blood-serum agar in the ordinary way, and when tested were found to agglutinate completely with Type III. serum and Flexner's polyvalent serum in a dilution of 1 in 200 at least. About 14 days later subcultures were made from the stock stab culture, and this was then found to be contaminated with a long-chained streptococcus. No streptococci were observed in the original films. The culture was purified and a stock of carbolised

suspension was made up. Owing to an accident the stock culture was now lost. When agglutinations were next carried out with the suspension the coccus was found to be inagglutinable with the 4 "type" sera (1 in 200), but still agglutinable with Flexner's serum 1 in 200, and partially 1 in 400. No absorption of agglutinin from the 4 "type" sera could be demonstrated on repeated tests. The unknown coccus absorbed its own agglutinins only from Flexner's serum.

In order to throw more light upon this coccus its agglutinogenic action was tested by preparing a rabbit by intravenous injection. A serum was thus obtained which was

TABLE II.—*Classification of Meningococci by Absorption.*
Plus signs in proportion to the degree of absorption.

Suspensions of cocci from c.s.f. No. of case.	Agglutinating sera. Type I.	Type II.	Type III.	Type IV.
4	+ + +	0	0	0
6	+ + +	0	0	0
5	+ + +	0	0	0
8	+ + +	0	0	0
9				
343	+ + +	0	0	0
166	+ + +	0	0	0
182	+ + +	0	0	0
437	+ + +	0	0	0
469	+ + +	0	0	0
527	+ +	0	0	0
536	+ + +	0	0	0
566	+ + +	0	0	0
565	+ + +	0	0	0
633	+ + +	0	0	0
687	+ + +	0	0	0
696	+ + +	0	0	0
705	+ + +	0	0	+
769	+ + +	0	0	0
846	+ + +	0	0	0
868	+ + +	0	0	0
1023	+ + +	0	0	0
809	+ + +	0	0	0
1063	+ +	0	0	0
236	0	+ +	0	0
344	0	+ +	0	0
414	0	+ +	0	0
468	0	+ + +	0	0
563	0	+	0	0
632	0	+	0	0
704	0	+ + +	0	0
790	0	+	0	0
737	0	+	0	0
845	0	+ + +	0	0
841	0	+ + +	0	0
1				
142	0	0	+	0
206				
1118	0	0	+ + +	0
695	0	0	0	0
285	0	0	0	+ + +
357	0	0	0	+ + +
415	0	0	0	+ +
567	0	0	0	+ +
619	0	0	0	+ +
949	0	0	0	+ +

capable of agglutinating No. 695 and Type III. cocci and also to a slightly less extent Type I. cocci. A feeble action was observable upon Type II. cocci and none upon Type IV. cocci.

This No. 695 serum was then saturated in different samples with No. 695 coccus and each of the 4 "type" cocci, and these saturated samples were compared with an unsaturated sample as regards the actions upon No. 695 coccus and the "type" cocci. The results of these experiments were as follows:—

Saturation with—
Type I. cocci removed agglutinins for Type I. completely and slightly for Type III. and No. 695.
" II. cocci removed agglutinins for Type II.
" III. cocci removed agglutinins for Type III. completely and slightly for Type I. and No. 695.
" IV. cocci removed agglutinins for no type.
No. 695 cocci removed agglutinins for No. 695 and Type I. completely. Type III. was unaffected.

On the whole, therefore, it would appear to be clear that No. 695 is a variant from the Type I.–III. group. From its agglutinations and also its agglutinogenic action it would seem to be more closely related to Type III., but its absorptive action from its own serum is more suggestive of a relationship to Type I.

Conclusion.

Gordon's statement that practically all meningococci capable of producing cerebro-spinal fever are found to belong to one of his 4 groups is confirmed by our results. It therefore follows that an unknown coccus from the throat or elsewhere which does not belong to one of these 4 groups is not likely to be a pathogenic meningococcus. This rule may be taken to be invariable for practical purposes.

Postscript.

This paper was written before the publication of No. 114 of the Reports to the Local Government Board upon Public Health and Medical Subjects by Eastwood, Griffith, Scott, and others. In their report these authors elaborate their view that the grouping of meningococci by serological methods is an artificial procedure which depends upon the arbitrary selection of particular strains as standards. They hold that a classification based upon certain representatives of "types" will not necessarily hold if other examples of the same "types" are taken as standard, and thus different laboratories may find themselves in the possession of standards which do not correspond. So far as we ourselves are concerned, we agree to some extent with the Local Government Board workers, but we are not prepared to follow them in denying a great practical value to these classifications. We do not consider that the similarity between the I.–III. group and the IV.–II. group is close enough to allow much chance of confusion of standards, but undoubtedly Types IV. and II. may sometimes have characters in common, especially when isolated from the throat, and in these cases the selection of strains which have the characters of each type evenly balanced may lead to confusion. If, on the other hand, strains are selected for standard which are "typical" and show the characters of one "type" to a preponderating degree, it appears to us that the differences are then sufficiently great to avoid confusion.

The fact that strains exist which exhibit the features of two "types" to a variable degree does not in our opinion invalidate a classification based upon the purer members of the "types." Practically all biological classifications depend upon the selection of pure types for standards.

A CLINICAL CONTRIBUTION TO THE STUDY OF P.U.O.

BY W. PASTEUR, C.M.G., M.D. LOND., F.R.C.P. LOND.,
TEMPORARY COLONEL, A.M.S.; A CONSULTING PHYSICIAN TO THE BRITISH ARMIES IN FRANCE;
AND
BERNARD HUDSON, M.D. CANTAB., M.R.C.P. LOND.,
TEMPORARY MAJOR, R.A.M.C.

WE are tempted to publish the notes of this case for more reasons than one. While possessing considerable clinical interest of its own, it appears to us to throw light on a group of cases of P.U.O. with which we are both familiar and which seems to us to deserve closer study. Further, the fact that the patient was a medical officer of experience enables us to present a more accurate and informing account of the subjective side of the case than is usually possible. The patient was under the immediate care of one of us (B. H.), but we saw him daily in consultation throughout his illness.

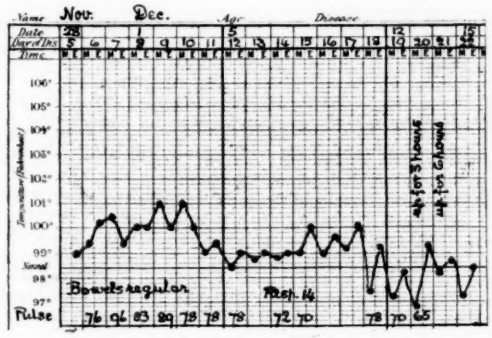
Dr. X——. Previous health good. Fourteen months in France. T.A.B., September, 1916. Began to feel "cheap" about the middle of November, 1917. On Nov. 24th he felt ill, appetite failed, and he suffered from slight evening chills till Nov. 28th, when he was admitted to hospital with general malaise and a temperature of 99° F. Diagnosis P.U.O. As the chief interest of the case centres in the condition of the right lung, the other features of the illness may conveniently be dealt with briefly in this place.

Headache, though occasionally severe at first, was never a marked feature. On the other hand, there was persistent painful hyperæsthesia of the scalp until the temperature fell. There was a total absence of catarrhal symptoms in the large bronchi, trachea, larynx, and upper air-passages throughout. The tongue remained clean throughout. There was total anorexia during the first week in hospital. Insomnia was marked during the same period. Depression, both mental and physical, was very marked until the remission in temperature on Dec. 4th. The pulse generally ranged between 70 and 80, and was regular and of good tension. During the height of the attack (Nov. 30th to Dec. 3rd) it rose to 96 on three occasions. The respiration

rate was never raised at all. The urine presented the usual febrile characters and contained a cloud of albumin at onset. The spleen was never enlarged or tender, and there were no abdominal symptoms at any time. There was a slight dry hacking cough on admission, which increased somewhat in severity during the first week, but was never really troublesome.

Progress of case.—The temperature rose gradually to 101° during the first 24 hours. On the 29th (evening) patient complained of pain over the right back, beneath the scapula and in the interscapular region, radiating outwards beyond the scapula and upwards to the shoulder. It had none of the characters of pleuritic pain and seemed to be muscular. It was distinctly aggravated towards the end of a deep inspiration and was almost in abeyance during quiet breathing, but it was never acute in character. It reminded the patient vividly of the pain he had suffered in the same region, in 1890, during a severe attack of catarrhal influenza. At the same time he became conscious of a difficulty in expanding the right lung fully. There was a feeling of discomfort and dragging deep down in the right chest, apparently about the root of the lung, and a feeling as though, during deep breathing, the lung were being prevented from expanding by some elastic back-pull. This sensation never amounted to actual pain.

The sensations just described lasted for about four days and then gradually disappeared. On physical examination of the chest next morning (Nov. 30th) the following condition was found: Very slight percussion impairment over right lower lobe behind, most marked at the angle of the scapula. Over this area, at the end of deep inspiration, there are some fine viscid sticky râles, but no other adventitious sounds of



any kind. The entry of air into the right lower lobe is definitely diminished, but the respiratory movement of the right chest is not affected. Vocal fremitus is normal and equal at both bases, but there is slightly increased conduction of whispered sounds at the right base, especially near the angle of the scapula. Beyond the diminished air-entry there is no recognisable alteration in the respiratory sounds over the affected area.

The signs just described, though definite enough, were very slight in degree and might easily have been overlooked in a perfunctory examination of the chest. It was definitely determined that the fine sticky râles made their appearance at the exact moment that the patient became conscious of the opposition to the expansion of the right lung described above. Cough was rather more troublesome, especially in the early morning and late afternoon; no cough to speak of through the day and during the night. Expectoration scanty, consisting of a few viscid somewhat rusty muco-purulent pellets.

Dec. 1st: Condition much the same.

Dec. 2nd: Morning temperature 101°. Physical signs as above, but râles a trifle more liquid and less sticky and still only audible at end of deep inspiration. Percussion impairment more distinct over the right lower lobe behind. It is to be noted that it never reached the pitch of actual dullness. Patient very depressed mentally and physically, but there is no dyspnœa and a complete absence of the usual toxæmic effects of an ordinary pneumonia. Examination of the blood showed a leucocyte count of 12,000. The agglutinations for the enteric group were negative. Spleen not felt; no abdominal symptoms. The sputum, which was slightly rusty, was examined on two separate occasions. It contained considerable numbers of pneumococci—definitely the preponderating organism—and moderate numbers of what was probably *Micrococcus catarrhalis*; there were no bacilli in any of the smears examined. The sputum contained large numbers of broken-down pus cells, numerous alveolar cells, and a few columnar cells. There was no elastic tissue.

Dec. 4th: The temperature, which was 101° yesterday morning, has fallen to 99°, and there is a corresponding improvement in the general condition. The air-entry at the right base is much freer and the râles fewer and less easily elicited. The sensation of obstruction to the expansion of the right lung has practically disappeared, together with the pain in the chest wall on deep inspiration. There is still slight flattening of the percussion note over the affected base.

Dec. 9th: Temperature remained at 99° till last evening when it rose to 100°. On examination it was found that the lung condition described above had spread round to the anterior part of the lower lobe, over which the percussion note was now slightly impaired and the same fine sticky râles heard at the end of full inspirations. This extension was not accompanied by any appreciable set-back in the patient's condition, which was slowly improving since the 4th. There was a little increase of cough for 24 hours and a temporary reappearance of rustiness in the sputum. Nor was this extension accompanied by any return of the subjective sensation of obstruction to expansion, though there was a slight degree of "muscular" pain in the chest wall over the newly involved area for about 18 hours. The illness terminated by a distinct crisis, accompanied by a profuse sweat on Dec. 11th, the seventeenth day of illness, and was followed by rapid recovery, the patient being up and about on the 14th. On the 15th it was impossible to detect the slightest abnormality in the right lung, with the single exception of the least degree of flatness on percussion near the angle of the right scapula, which disappeared entirely after taking a couple of deep inspirations.

Summary and Remarks.

It is by no means easy to place this case. If the lung condition had escaped notice, which might quite easily have happened, the diagnosis P.U.O. without qualification would have been made without hesitation. The point of interest is whether the facts observed—whatever may be their true interpretation—do not throw some light on one variety at any rate of P.U.O.

They seem to us to justify the conclusion that Dr. X—— suffered from an acute or subacute infection, most probably pneumococcal, which gave rise to unusual changes, of strictly lobar distribution, in the lower lobe of the right lung. It cannot be argued that he had pneumonia, as practically none of the physical signs and certainly none of the symptoms of that condition were present, and the same objections hold good in regard to broncho-pneumonia as we generally meet with it. The onset of the illness was acute; it terminated by crisis and there was a total absence of catarrhal symptoms from beginning to end. The course and duration of the fever bear a close resemblance to that met with in many cases of P.U.O. There were never any signs of pulmonary consolidation and no indication whatever of termination by resolution (moist râles, lowered functional activity of affected lobe, &c.). As soon as the cause—whatever it was—of the diminished air-entry was removed the affected portion of the lung recovered its full functional integrity within two or three days, at the outside.

Our reading of the case is that the air-way to the right lower lobe (and that only) became partially blocked, probably by a localised (? dry) inflammatory swelling of the bronchial mucous membrane, and that this led to partial deflation of the lung beyond. A very slight extension of such an inflammation might easily involve a certain number of the bronchioles and possibly alveoli in the immediate neighbourhood. A condition such as this would, we believe, satisfactorily account for all the signs and symptoms presented.

If it is objected that localised inflammations of the lower air-passages are not recognised or described it will, at any rate, be conceded that localised inflammations of infective origin, limited to the trachea or the larynx, for example, are common enough, and we know of no valid reason why such an event should not occur further down the bronchial tubes. Be this as it may, we are for the moment only putting forward the suggestion that, as the result of an acute or subacute bacterial infection—pneumococcal or other—localised lesions may be set up in the bronchi beyond the main bifurcation, and that such lesions do not necessarily become generalised, spreading downwards to produce the familiar symptoms of bronchiolitis or broncho-pneumonia, but that their presence may give rise to certain other changes in the lungs which may be detected by careful physical examination. We do not base this suggestion on this isolated case. We have both met with a number of

cases bearing a more or less close resemblance to it—cases of P.U.O. which suggested pneumonia and were not pneumonia or broncho-pneumonia, but something else. One of us (W. P.) has for months past directed the attention of medical officers to the fact that in cases of P.U.O., without any focal signs or symptoms, careful examination of the bases sometimes reveals the presence of slight, apparently deep-seated, change in one or other lung, and drawn attention to the peculiar fine sticky râle in deep inspiration which was such a marked feature in the case we have just described—a râle, by the way, which has nothing in common with the fine râles of œdema, but suggests the passage of air under pressure into collapsed bronchioles and alveoli.

We do not wish to imply that there is a cut-and-dried category of P.U.O. which conforms strictly to the case we have just described. If the occurrence of localised lesions of the deeper bronchi is a reality, it would follow almost of necessity that their effects on the lungs would vary from case to case according to their situation and extent.

Is it not possible that the featureless aspect of so many cases diagnosed as P.U.O. may be just because they are the clinical expression of smouldering bacterial infections which—for reasons it would be profitless to speculate upon here—have failed to become fully alight (active) and thereby more individualised and recognisable in their outward expression? Had the infection in our patient been more active and shown a tendency to spread we should without doubt have had on our hands a case of pneumonia or broncho-pneumonia instead of one which, under existing conditions, we can only label P.U.O.

THE LOCALISATION AND REMOVAL OF FOREIGN BODIES BY THE COMBINED METHOD OF RADIOSCOPY AND OPERATION,

WITH SUGGESTIONS FOR THE STANDARDISATION OF METHODS,

BY ROBERT KNOX, M.D. EDIN.,

CAPTAIN, R.A.M.C. (T.); CONSULTING RADIOLOGIST, GREAT NORTHERN CENTRAL HOSPITAL; AND RADIOLOGIST, KING'S COLLEGE HOSPITAL.

IN view of the large number of papers already published dealing with the localisation of foreign bodies any further publication on the subject might at first sight appear to be superfluous, and it may be admitted that this consideration has for long restrained the writer from publishing anything on the subject. Many of the papers detail admirably the technique of localisation. Most of them are more or less practical and useful, but a consideration of the literature of localisation forces the conclusion that there is still something lacking, though exactly what it is is very difficult to define.

Consideration of Present Position.

The existence of so many methods clearly indicates the need for standardisation, not only of methods of localisation, but also of the apparatus by means of which the necessary evidence is obtained. Such standardisation of methods of localisation and apparatus used would soon lead to a uniformity of results. The adoption of one good method universally for the localisation and removal of foreign bodies would be an important step towards this end.

From a considerable experience in localisation of foreign bodies, the interpretation of the results, and the subsequent operative measures for their removal the writer is compelled to admit that in many instances the information provided by the radiologist does not convey in an intelligible manner the necessary information to the surgeon. It is either a bald statement of facts and measurements, or it is an exhibition of negatives from which the surgeon is expected to deduce the information. A pair of flat negatives in two positions may give the necessary information in a number of cases, but in the majority they fail to do so. Stereoscopic plates, if intelligently interpreted, give all the information required, but many surgeons are unable to appreciate the information when so conveyed.

Experience in the operating-room will soon convince the radiologist that however much he may pride himself on the accuracy of his localisation (and in the majority of cases where accurate technique is employed there can be no question on this point) he has totally failed to give the surgeon a mental picture of the exact location of the foreign body and its relationship to anatomical landmarks in its vicinity. That is the crux of the whole matter, once a dissection has been begun the marks on the skin become practically valueless. The subsequent procedure on the part of the surgeon in difficult cases ends in a blind probing in an endeavour to discover the foreign body; hours may be wasted in some cases, and in the end failure is the result.

The endeavour of the radiologist must therefore be, if localisation alone is relied upon, to give the relationship of the foreign body to well-known landmarks as well as its depth from the surface. This can be rendered more valuable by the adoption of what might be described as the graphic method of demonstration by means of carefully drawn diagrams on which the exact location of the foreign body is marked, and its depth given from the skin surface. This method will be found extremely useful in a number of cases, but in others it will be found that there is something wanting. A further step towards accuracy in localisation and success in removal would be the collaboration of the surgeon and the radiologist in the operating-room. This will be found to be the most satisfactory of all.

The object of the writer will therefore be to refer (1) to the best known methods of localisation in order that the surgeon may see the matter from the radiological point of view; (2) the graphic interpretation of the result to the surgeon; and (3) the combined method of radiography and surgery in the operating-room.

It will be necessary, therefore, to deal with the matter under three distinct headings, namely:—

1. The localisation of foreign bodies.
2. The interpretation of the results (graphically).
3. The methods which may be employed in the operating theatre, by means of X ray apparatus for localisation and as an aid to removal at the time of operation. The latter method has been described as that of intermittent control by radioscopy at the time of operation

This method has recently been described by two French radiologists, MM. Ombredanne and A. Ledoux-Lebard, in a paper published in *Journal de Radiologie et l'Electrologie* (vol. ii., March, April, 1916), but it is only fair to radiologists in general to point out that the method has been in use in this country for years and has become so generally adopted that it is a matter for surprise that so much attention should be called to it now.

Many years ago the writer employed the method at the Great Northern Central Hospital in collaboration with Mr. Edmunds for the removal of needles in the limbs of patients. Since the outbreak of war the method has been revived at the 4th London General Hospital in collaboration with colleagues there, and a number of cases have been operated on with success; in these cases removal had been in some instances attempted without success, the usual methods of localisation having been employed.

In view of these facts it has been considered expedient to revise the whole method of localisation and combined operation, in the hope that by so doing it will be possible to call attention to the subject and lead to a closer coöperation of the radiologist and surgeon under what may be described as the ideal method of localisation and removal of foreign bodies.

Precautions to be Observed.

Before entering into detailed descriptions there are several important matters to which attention must be called. The first is (*a*) the danger that undoubtedly exists for the operators when a large amount of screening is done; (*b*) the methods of preventing these dangers; and (*c*) the undoubted danger of X ray burning of the patient if too lengthy examinations are carried out.

Screening should only be employed for the shortest possible time, consequently the conditions under which it is conducted must be the best obtainable.

The chief of these is to provide for absolute darkness when the X ray tube is in action. This can be done by making the operating room light-proof and by covering all valve tubes; the X ray bulb can be completely enclosed in the ray-proof box. The operating room should have a double supply of lights. Powerful ruby or blue lights may be employed, by means of which the surgeon can carry out the necessary operative measures; if these are used the strain on the retina is minimised, so that when the X rays are in operation the observer can rapidly examine and locate

the foreign body. This leads to a considerable shortening of the time necessary to carry out the examination. Ordinary light can be used if absolutely necessary for operative work. The radiologist should then use coloured spectacles or should have a hood fitted over the head to exclude the white light.

The X ray bulb should be kept at a suitable degree of penetration to enable the observer quickly to make out the position of the foreign body. The bulb must be efficiently protected by thick sheets of lead incorporated in the wood of the box which contains the tube; the smallest possible aperture in the diaphragm should be employed when examining for the foreign body. The protection of the patient is secured if a plate of aluminium 2 or 3 mm. thick is placed between the X ray bulb and the patient to minimise the effect on the skin, and the duration of the exposure kept well within what would produce an erythema of the skin.

Whatever precautions are employed the possibility of damage to the patient's skin and to the operator's must never be lost sight of, consequently the shortest possible time for examination is the best of all precautions. The operator carries out a preliminary dissection, acting on a previously made localisation. When necessary he asks for a screen examination, and so on until the foreign body is discovered and removed.

Methods of Localisation.

(*a*) *Plate method:* (1) With the X ray tube above the patient; (2) with the X ray tube below the patient; (3) stereoscopic localisation: (a) tube above the patient; (b) tube below the patient.

(*b*) *Screen methods of localisation.*—These necessarily consist of examination with the patient on the X ray couch, tube below the couch, the fluorescent screen above the part to be examined.

It may be assumed that the principles of localisation of foreign bodies by means of X rays are generally understood; for our present purpose it will suffice to deal briefly with the methods generally employed and point out the advantages each possesses.

Plate methods.—On considering the plate methods we find that there are two positions of the tube: (*a*) above the subject, the plate being placed below; (*b*) the tube below the subject—i.e., placed under the couch or table upon which the patient lies. The plate method possesses several advantages over the screen method as follows:—

The chief advantage is the production of a permanent record of the foreign body, its relationship to bone, and the existence of an injury to the bone or soft parts in its vicinity. This is in itself an important argument in favour of this method becoming a standard one. Another and by no means an unimportant advantage is the fact that it does not lead to the exposure of the operator to the injurious action of the rays. When the tube is placed below the table the plate method may be combined with the screen method when a record of the condition observed is required.

The *stereoscopic method* is undoubtedly one of the most useful, as by its use information as to the exact position of a foreign body and its relationship to anatomical landmarks in the vicinity can be obtained. It is possible to demonstrate the exact position of a foreign body when the two plates are examined in the stereoscope. This method will be found to be a most valuable aid to the determination of position in difficult cases, but there is very little likelihood of it ever being adopted as a standard method, because of the heavier expense and time occupied in producing the plates. The stereoscopic method may be employed with the tube either above or below the couch.

Screen methods.—These are very numerous—some are exceedingly ingenious—all are based on the same general principle. The localisation can be carried out entirely by the screen, or plates may be employed for purposes of corroboration. The distance from the anticathode of the tube and the surface of the plate must be known—when possible it is well to maintain a fixed distance between these two points, then a table of measurements calculated for that distance can be prepared which gives the depth of the foreign body for a particular displacement of the shadow. The tube displacement should also be a constant quantity. When the plate is employed two exposures on one plate will be sufficient for practical purposes.

Aids to the Interpretation of the Exact Position of Foreign Bodies.

When radiographic measures have been employed it is possible, after a simple procedure of calculation and measurement, to state that the foreign body occupies a definite position in relation to the marks which have been placed upon the skin surface, and to note its relationship to the anatomical landmarks in the vicinity. Stereoscopic plates when examined in the stereoscope give us the best impression of the position of the foreign body and its relations to anatomical landmarks and to marks placed upon the skin surface. It is most valuable because it is the only means we possess of visualising the parts and conveying to the surgeon an exact appreciation of the location and often the difficulties likely to complicate an operation for its removal. A knowledge of anatomy enables a mental picture of the position of the foreign body to be formed which will be useful when an operation is carried out for its removal. This is the most satisfactory method of interpretation we possess because it enables us to reach the foreign body independently of the skin markings, which latter are frequently of no value after the preliminary incision has been made. A thorough knowledge of anatomy is, therefore, essential on the part of both the surgeon and the radiologist, and enables the conveying of the findings of the radiologist to the surgeon to become an easy and reliable procedure.

A series of radiographic charts would be found useful in reporting the results of localisation, and several valuable aids exist towards the compilation of such charts. Of these, attention must be called to a paper by Dr. J. Metcalfe and Dr. E. M. Keys-Wells, published in THE LANCET, May 27th, 1916. This gives in outline a table of measurements, made upon the cadaver, of the prominent bony parts in the body. These tables might quite readily become the basis of a series of standard measurements.

Professor Symington has produced a valuable work on Sectional Anatomy which will be found to be of the greatest possible value to the radiologist and surgeon in their efforts to localise and remove foreign bodies—and it should facilitate the work of the radiologist in conveying his results in an intelligible fashion to the surgeon. Captain P. T. Crymble has called attention to the value of sectional anatomy in this relationship in a paper published in the *British Journal of Surgery*, vol. iv., Nov. 14th, 1917.

A careful study of the admirable stereo-photographs in the "Edinburgh Stereoscopic Atlas of Anatomy" will also repay the radiologist whose knowledge of practical anatomy has become rusty from lack of practice and the lapse of years. When stereoscopic radiographs have been taken a comparison of these with the corresponding anatomical part photographed stereoscopically should be of use in definitely localising the foreign body.

Thus, careful comparison of the radiographic findings, anatomical illustrations, and stereoscopic photographs should enable us to determine the exact position of the foreign body and its relations to anatomical landmarks. It is still necessary to illustrate the findings graphically, since the radiologist may not always be in intimate touch with the surgeon. For this purpose I am having prepared a series of drawings from anatomical and radiographic studies which may be regarded as standards for the purpose of issuing a report which will be intelligible and indicate the position of the foreign body in its relationship to anatomical structures in its vicinity.

Combined Localisation and Operative Measures.

Of all the methods so far employed whereby the surgeon and the radiologist collaborate, undoubtedly the most satisfactory is that of the combined work in the operating-room. When the pressure of work is very great the employment of this method is most economical in several respects. It obviates the use of a large number of photographic plates and the time necessary for their production. This is in itself an important factor in favour of the use of the combined method. It saves the time of the radiologist and surgeon in their joint consideration of the finished plates. But the chief advantage is the great saving of time in the operating-room. By this combined method it should be possible quickly to localise and remove any foreign body which is surgically accessible. After the preliminary localising measures have been taken the surgeon is in a position to proceed at once with the operation. Should he fail to find the foreign body quickly it is only necessary to darken the room, examine for the position and, if necessary, re-localise the foreign body. In difficult cases the instrument may even be guided to the foreign body. The saving of time which follows upon the combined method may be in a number of cases very considerable. Instead of one or even two hours spent in exploring for a foreign body situated in a difficult position the whole operation may be reduced to a quarter or half an hour. When a considerable amount

of work has to be got through this is a most important matter.

Assuming, therefore, that the combined method is the best of all for the localisation and removal, what are the essentials for the efficient execution of the combined effort? The chief of these are:—

(1) Accuracy of localisation. This may be secured by adopting the most perfect mechanical apparatus available.

(2) The next and not the least important condition is that the method must be carried out with due regard to the protection of: (*a*) the operators and assistants, and (*b*) the patient.

(3) Another important matter is that the operation must be conducted under ideal surgical conditions. The operating room must therefore be a perfect one with all surgical accessories, and at the same time be capable of being converted into an absolutely dark room; from the radiographic point of view this is most important. Given a perfectly darkened room then the radioscopic measures may be carried out with expedition and success.

It will therefore be necessary to consider these various points in order and at considerable length, if we are to arrive at a satisfactory explanation of this most useful method.

For the employment of the screen method of localisation it is generally necessary to examine the patient while he is lying upon a table or X ray couch. Other positions are only possible when the patient is not under an anæsthetic, so for practical purposes the description must be confined to the examination on the operating couch. The arrangement of the X ray tube and the localising apparatus up to the present is largely a matter of choice upon the part of the radiologist; so long as accuracy is secured it matters little what method is employed, but since in this article the intention is to indicate the possibility of standardisation of method, apparatus, and the recording of results, what in the writer's opinion, at least, is the best method, will be described.

The description may be limited to several well-known pieces of apparatus: (1) the Mackenzie Davidson localising table; (2) the Bruce director couch (with modifications); (3) Baese's localiser and explorer; and (4) a suggestion for a new table constructed on similar lines to the first two.

The Localising Couch.

Nearly all of the practical methods of localisation now in use are based on the work of Mackenzie Davidson. The most commonly used method is to place the patient upon a couch, the tube under the table, the fluorescent screen and localising device above the patient. This is the position which commends itself for operative measures, so it might reasonably be suggested as the standard position for localising and operating. All cases, however, do not require operation. It would still be a rational measure to examine *all cases* in the position most suitable for operation.

The difficulty in this method up till quite lately has been to get the part examined at a fixed distance from the tube, a most important point in standardisation. This has led to the production of a number of tables calculated for various tube distances. Mackenzie Davidson has overcome this by having a fixed distance between the tube and the screen—by mechanical adjustments the surface of the screen is arranged to make contact with the skin surface—the tube moves vertically up and down in the tube box. Furthermore, he has done away with the need for tables by adding an ingenious device which records the displacement of the object when the tube is moved and automatically registers the depth of the foreign body.

Baese in his localiser and explorer has also adopted the fixed distance between the tube and the screen. Davidson ascertains the depth by a displacement of the tube in one direction. Baese measures the depth by a displacement of a graduated scale attached to the fluorescent screen. Either of these methods might be adopted. For practical purposes in this country Davidson's will be found to be the more readily adapted.

For operative purposes the Mackenzie Davidson apparatus can readily be arranged if a surgical table on four legs and having a stout aluminium top is provided.

The tube with its protected holder and localising device, which might for convenience be referred to as the localising unit, can be fitted up independently of the table; then it is only necessary to arrange the table with the patient over the tube box, the part is arranged for localisation, and table, patient, and part so arranged fixed by clamps. The localisation is quickly carried out, the skin is marked. The radiologist now stands aside, the localising unit is removed, and the surgeon proceeds with the operation. He has a spot marked on the skin and has been told the depth. Should he not quickly find the foreign body the localising unit is again brought into position and the foreign body re-localised. If difficulty still persists the surgeon can be directed to the foreign body by screening while operating. This latter procedure should be used as little as possible. Over-exposure to X rays will sooner or later lead to dermatitis. This to a practising surgeon would be little short of a calamity. Rubber gloves worn by the surgeon offer no protection against X rays, although some surgeons have asserted that they do. All operators using X rays while operating must keep the hands and arms well away from the localising beam of rays.

The tube must be thoroughly shut in by lead or lead-glass. Mackenzie Davidson's latest table is admirably furnished with a large well-lined tube box which cuts off all but the rays emitted from the diaphragm aperture.

The whole of the "localising unit" could be made of metal, and would then have all the precision, if well constructed, of a micrometer scale; this would ensure accuracy in estimating the position and depth of a foreign body. Most of the apparatus in present use lacks the final finish in construction which is so conspicuous in properly constructed mechanical apparatus. The measuring instruments on a localising couch should be as precise and accurate as the instruments used on a gun. Accuracy in estimation of distance in both means successful execution of purpose. The X ray table must be constructed to admit of it being readily arranged over the "localising unit." It also can be made of metal, but the top must be of some material which is not too opaque to the X rays. Aluminium of 2 mm. thick would serve admirably for this purpose.

Dr. Ironside Bruce has introduced a couch which might readily be adapted to carry out the preliminary localisation and the subsequent procedure for the removal of the foreign body.[1] A director is attached to the arm which in the preliminary observations carries the fluorescent screen; this indicates the direction which the surgeon must follow to reach the foreign body. By substituting a larger fluorescent screen than that used by Bruce and making a few alterations in the details this would be an admirable combined radioscopic and operating table.

Signor Baese has introduced a localiser and explorer which is most ingenious in its application, and with a few modifications might readily be adopted as a localising unit for use in the operating theatre. This localiser has been described by Professor J. Bergonié in the *Archives d'Electricité Médicale et de Physio-Thérapie*, February, 1917. Baese has rejected generalised methods and all calculations; in his method the centre of rotation is movable in the direction of the "normal ray" or "in a plane parallel to it," and thus the axis of rotation is made to pass through the body to be localised. The intersection is determined by the simple criterion—i.e., the mobility or immobility of the shadow when the axis of rotation intersects the foreign body, and when the position of the centre of rotation is known the position of the foreign body is established.

Modification of a Localising Couch to Operative Requirements.

Since any part of a patient's body must be readily adjusted in the path of the central rays of an X ray bulb—i.e., between the focus point of the tube and the central point where the rays emitted from it impinge upon the fluorescent screen—it is essential that the table should have rapid mechanical movements. Some modification of the existing tables appears to be indicated. The suggestion is that the tube box, with its fittings and localising attachments, should be made separately from the table. The Baese localiser and explorer is admirably adapted to this purpose, it is complete in itself, can readily be removed from the table, and is quickly readjusted; it is, therefore, an excellent "localising unit." When a unit of this type is used the operating table may be of the ordinary type so long as it is possible to place the X ray tube box under it.

When the localising unit is fixed the table used for the operation should be capable of movement in two directions. This can readily be attained if it runs on rails allowing of movement in two directions; immediately the part to be examined is arranged in the path of the central

[1] THE LANCET, 1916, i., 274.

beam the table is clamped in position. The table may consist of a metal frame, the top should be of aluminium sufficiently thick to ensure rigidity; this aluminium top serves a double purpose, it protects the patient's skin from the action of the softer X rays by absorbing them and it is readily sterilised.

The essential part of the equipment is the localising device and the X ray bulb. Undoubtedly one of the best at present in use is that recently introduced by Mackenzie Davidson. A valuable addition to the table would be to fit it with a second tube box so placed that a lateral view could readily be obtained.

This might be achieved in two ways: (1) By having attached to the tube box a swing-over ratchet which would carry the tube box to an exact right angle from the original position; (2) a second tube box, accurately centred, could be arranged in position, so that, by using a change-over foot-switch, the current could quickly be changed from one tube to the other. An arrangement of this kind, in whatever way obtained, would be extremely helpful in difficult cases.

Other Points.

The assumption has been made that localisation prior to operation will become a routine measure in all hospitals.

The radiologist will, however, examine many cases which do not proceed to operation. It will therefore be necessary for him to report on the exact position of the foreign body in order that the surgeon may be able to decide upon the appropriate treatment. The localisation should be carried out in precisely the same way as when operation is contemplated.

The report on the case should be amplified in order to convey, if possible, an idea of the position of the foreign body in relation to anatomical landmarks. A careful consideration of the negatives, depth measurement, Metcalfe's and Keys-Wells's tables, Symington's Atlas (Sectional), with in difficult cases stereoscopic plates, should enable the radiologist graphically to demonstrate its position. For this purpose, as already mentioned, I am having a series of diagrams prepared. By the aid of charts of this kind the work of the radiologist is rendered intelligible to those not familiar with radiographic technique. These diagrams could readily become a unit in a standardised scheme.

The close collaboration of the surgeon and the radiologist is essential in a scheme of this kind. Surgeons as well as radiologists should familiarise themselves with the necessary principles of localisation—particularly stereoscopic, which is an invaluable aid to the appreciation of position in a difficult case. A few hours spent in the X ray department by all operating surgeons would be a most profitable step towards perfection in operating for the removal of foreign bodies.

When difficulties in removal arise it is not always the radiologist who is at fault, frequently the surgeon is hopelessly wrong in his appreciation of the exact position of the foreign body. Occasionally anatomical considerations may render it impossible to remove a foreign body; in such cases if the surgeon has received accurate information as to position he should have realised the difficulty and have refrained from operating. Several instances of this kind have occurred where, when the difficulty of removal was great, the surgeon has wisely refused to proceed with the operation for removal. Surgeons as well as radiologists vary in their power to appreciate the difficulties of a localisation.

The last stage in the standardisation of methods would be to arrange for the instruction of all radiologists appointed to the charge of X ray departments at a convenient centre prior to going on service. This could be done at a school or hospital where a department would be fitted up on standard lines with all the necessary apparatus for accurate work. A complete collection of plates illustrating typical cases would be useful for purposes of demonstration. At such a school surgeons would be welcomed and demonstrations given on difficult points.

Conclusions.

If a standard method of localisation is to be developed it appears that the fluoroscopic offers the strongest claims to its adoption for the following reasons:—

1. It is convenient for the radiologist and essential from the operative point of view, and when combined with the latter it is the method which will be most successful.

2. It is most economical from both points of view—i.e., it saves the time of the operators and the cost of plates.

3. When combined with scientifically constructed localising apparatus it is mathematically accurate.

4. It enables the operators to re-localise and so correct any error which may have occurred.

5. It may be used as a guide to the surgeon. It could be improved upon in this respect if stereoscopic fluoroscopy became a practical entity. That this is possible there is no shadow of doubt. The method could with a little experimental work become thoroughly practical. That this is so is proved by work being done in France and America.

Should the fluoroscopic method become general it must be insisted upon that all protective measures must be employed. Operators must keep out of the way of the active radiations if disaster is to be avoided. Surgeons must realise the importance of not exposing themselves unnecessarily to the rays; consequently it should only be used for very short periods of time as a controlling agent. Apparatus must be carefully examined to ensure that all the protective measures are really safe.

In difficult cases the plate method, and particularly the stereoscopic, will be found indispensable—the object of its use being to present to the surgeon a picture of the exact position of the foreign body. The plate method cannot be dispensed with because there are occasions when the foreign body cannot be satisfactorily seen with the screen method; in these cases the plates will give more helpful aid than the screen. Foreign bodies in the eye and orbit, skull, spine, and pelvis should always be localised by the plate method prior to operation. The screen method may in these cases be used as an aid at the operation. The telephone probe will be found most useful in dealing with difficult cases.[2]

The adoption of standard methods could not be carried out simultaneously throughout the numerous military hospitals now on active service. It is obvious that the process of standardisation must be a gradual one, but if decided upon it would be possible to fit up all new hospitals with standard apparatus. The initial cost of fitting all hospitals with standard outfits and X ray operating-theatres would be a heavy item from the financial point of view alone. It is, however, quite unnecessary to do this; indeed, it would be wasteful. Several hospitals at the base and in England could be equipped for the work, and all difficult or doubtful cases referred to these hospitals for investigation and operation. In this way several surgical experts could undertake all the operative work for the removal of foreign bodies. They would have the advantage of expert radiologists working with reliable apparatus to help them in deciding upon operation, and in the operating-theatre when difficult cases were undertaken a large amount of most useful work could be systematically dealt with.

THE TREATMENT OF STAPHYLOCOCCAL INFECTIONS BY STANNOXYL: FURUNCULOSIS AND ACNE.

(*Method of* GRÉGOIRE *and* FROUIN.)

BY ARTHUR COMPTON, B.A., M.B. R.U.I., D.Sc. N.U.I.,
CAPTAIN, R.A.M.C. (TEMPORARY); OFFICER IN CHARGE MILITARY BACTERIOLOGICAL LABORATORY, DORSET DISTRICT; FORMERLY RESEARCH ASSISTANT, INSTITUT PASTEUR, PARIS.

Frouin,[1] in pursuing his interesting researches on the action in vitro of metals, particularly the rare metals, on different bacteria, has recently been led to investigate the influence of tin and its derivatives on the growth of staphylococci. With Grégoire [2] he has established that this element, its chloride or its oxide, when added to ordinary bouillon culture-medium, strongly inhibits the growth under anaerobic conditions of staphylococci; while under aerobic conditions the growth of staphylococci is not hindered, but the virulence of the microbe is diminished. That fact, coupled with the observation coming from the district of Beauce that furunculosis is an unknown affection among tin-workers of the region, formed for Frouin and Grégoire the starting-point for testing in vivo the therapeutic value of tin in staphylococcal infections. They found that intravenous

[2] THE LANCET, 1915, i., 217.

injection of the chloride or hydroxide of tin in the rabbit, 12 hours after intraperitoneal inoculation of virulent staphylococci, retarded the death of the animal by several days.

As a result of these experiments Grégoire and Frouin have given us for the treatment of lesions of staphylococcal origin the preparation stannoxyl, which is a combination of metallic tin and its oxide, entirely free from lead, a drug which, already in France,[3] has given such promising results in the treatment of staphylococcal infections (acne, furunculosis, &c.). In the present paper I propose giving an account of confirmatory results obtained by me with stannoxyl, kindly placed at my disposal by M. Frouin, in the treatment of seven cases of staphylococcal infection. These cases group themselves under the following headings.

Furunculosis.

CASE 1.—Lieutenant W., aged 40. Came to see me on July 16th, 1917, to have a vaccine prepared for two angry-looking boils on the neck, one on left side about ½ inch above collar, the other on right side at level of collar. Patient in a very excited condition, feeling, as he put it, that he was "in for a bad time." Some years previously he had had a very severe attack of boils, which at the time required drastic surgical interference, the scars from which on neck and scalp were plainly visible. At visit on July 16th I opened and expressed pus from both boils, the culture from same giving pure growths of *Staphylococcus aureus*. Boils were swabbed with tincture of iodine, dry dressings—as recommended by Frouin—being applied, and the patient put at once on stannoxyl internally. After two days' treatment with stannoxyl the tense feeling complained of in neck had practically gone and the condition was greatly improved, while two days later condition had quite cleared up. No return two months later. Patient only took in all some 20 comprimes (tablets) of stannoxyl.

CASE 2.—Driver T., aged 26. First seen by me at the laboratory on July 18th, 1917, where he was sent to have autogenous vaccine prepared. Three large boils present on neck, one in a particularly active condition, and many little boils beginning to point, besides numerous scars of old boils. Patient said that four months previously at Birmingham he suffered from a troublesome crop of boils, five of which had to be finally opened, drained, and packed with antiseptic gauze before they cleared up. Treatment with a stock vaccine had then been tried and failed. Stannoxyl treatment was begun at once (July 18th), the patient being recommended to take four comprimes (1 g.) per day first day, six the second, and eight on subsequent days, while continuing the ordinary hospital treatment of boric fomentations twice daily. On July 27th only two boils active; injection of 250 million staphylococci (autogenous vaccine) given. A week later (August 3rd) boils not so active, but two tense areas amongst old scars suggestive of deep-seated pus which might point at any time; 500 million staphylococci injected (arm). Seen again August 7th, condition considerably improved; patient felt better; leakage from active boils much less; tense swollen areas mentioned had become smaller, felt harder and more shotty; injection of 750 million staphylococci given. After this date vaccine treatment was discontinued, and stannoxyl, with local dressings, solely relied upon. On August 14th only two little openings from which occasional leakage of pus and lymph. Ten days later patient practically well; only slight leakage from one little opening, all others healed. Within a week this was closed and patient apparently cured. No return of boils since. In all some 170 comprimes of stannoxyl taken.

CASE 3.—Private J., aged 23. First seen on August 14th, 1917. Boils on posterior aspect of both thighs and buttocks around cicatrices of four large "nose-cap" wounds received in France in April, 1917, from which metal had been removed. Present attack six weeks old, beginning with a boil near one of the wounds. On left buttock the remains of some 30 or 40 healed boils could be counted. Had also a boil in full activity on external aspect of right elbow. Pus removed from same gave a pure culture of *Staphylococcus aureus*. About six years ago the patient had a severe attack of boils "right over the face, on the arms and legs." Treatment with stannoxyl begun at once, a box of 70 comprimes being given with instructions to take eight comprimes per day, while continuing the hospital local fomentations and dressings. Seen four days later (August 18th), boils on buttocks greatly improved, but a fresh crop showed evidence of breaking out in region of right elbow. Seen nine days later, the elbow condition had entirely cleared up, having apparently never come to anything, the condition on the thighs being much the same. Patient was given a second box of stannoxyl with instructions to continue taking eight comprimes per day. After this the case proceeded normally to complete cure, which was attained three days later. On Sept. 10th there had been no return of boils. In all about 100 comprimes of stannoxyl taken.

CASE 4.—Private G., aged 32. Seen on August 16th, 1917. An active angry-looking boil situated on outer aspect of right leg, just below knee, from which about 1 c.cm. of pus was easily expressed. Another boil in process of healing was situated further down the same leg. Over the left knee was an inflamed area of a commencing boil, while further down same leg on anterior aspect of ankle was a boil in process of healing. Stannoxyl treatment was begun at once, the ordinary hospital carbolic fomentations every three hours not being interfered with. Seen 16 days later (Sept. 1st), patient was to all intents and purposes cured; there only remained a little inflammatory spot about half way down outer aspect of right leg, as if a new boil was forming. Patient said this had been so for a few days, and was told to report again if anything came of it. He never did so; hence assumed to have been completely cured. Patient had previously an attack of boils on legs, 15 years ago, when in India. Quantity of stannoxyl taken: one box of 70–80 comprimes.

CASE 5.—J. E., civilian, aged 17½. Subject more or less to boils since the age of 13. Seen on Sept. 2nd, 1917, patient was suffering from a boil on left side of neck about size of fairly large bean. A boric fomentation recommended to clean and soften boil, and on Sept. 4th a culture was made from the pus. A pure growth of staphylococci was obtained. Internal treatment with stannoxyl begun on the 4th and local dressings of dry boric lint on boil. Five days later condition had entirely cleared up and there was no evidence of fresh boils. Treatment discontinued. In all 20 comprimes of stannoxyl taken. As drug had a marked constipating effect, only 4 comprimes were taken per day instead of 8, which patient had been recommended; bowels kept open with salts.

Acne.

CASE 6.—Private B., aged 21, laboratory attendant. Very troublesome acne on face since the age of 12. Condition showed weekly periodicity, in that about once a week there appeared a widespread crop of papules all over the face, eventually becoming pustular, which was most distressing. Between August, 1916, and April, 1917, patient had continuous course of treatment with autogenous vaccine (*Staphylococcus aureus*) at more or less weekly intervals, the doses ranging progressively from 50 millions to 5000 millions, and that without the least benefit. Vaccine treatment was, therefore, abandoned, and treatment with stannoxyl begun on June 23rd, 1917, and continued, 8 comprimes per day, till August 6th, during which time some 350 comprimes were taken. The condition rapidly improved with stannoxyl treatment, but between July 8th and 14th patient visited his home in Yorkshire "on leave," and while there he had a more or less full-blown attack. On account of this, on his return I continued him on treatment much longer than appeared necessary after his condition had again cleared up.

For a month after treatment was suspended, on August 6th, there was no return of the weekly attacks; but occasionally a papule would appear on the forehead, which quickly disappeared, the rest of the face remaining quite clear. Owing to the return of some six papules on the forehead, cheeks, and neck on Sept. 26th the patient was again put on stannoxyl, 6 comprimes per day. Anew there was an immediate response to treatment; inside a few days condition quite cleared up. This patient's condition being now so perfectly under control by stannoxyl treatment, it is hoped by successive courses of the drug eventually to completely cure him of his complaint.

Up to the present patient has taken in all 410 comprimes, about 100 g. of stannoxyl.

Infective Dermatitis (Otherwise Undiagnosed).

CASE 7.—Private D., aged 27. Seen on August 20th, 1917, being sent to laboratory for the preparation of autogenous vaccine. Purplish pustular eruption on extensor and flexor aspect of forearms, on back of left hand, on the neck, and a nodule on upper lip. Condition began six weeks ago while engaged on farm work. A Gram-negative diplococcus and a Gram-positive diphtheroid bacillus isolated on culture, but no staphylococci were found. Seen again a week later (August 27th), when a fresh culture was made from eruption on flexor aspect of forearm, in order to confirm above finding in regard to diphtheroid organism in view of preparing vaccine. Culture revealed presence of same diphtheroid bacillus, also of staphylococci. At this visit, in the absence of staphylococci being found in the first culture, the case was considered more suitable for autogenous vaccine, prepared with above diphtheroid organism, than for stannoxyl. However, during next few days, while vaccine was being prepared, the patient was put on treatment with stannoxyl, 8 tablets per day being taken. When seen five days later (Sept. 1st), condition very much improved. Stannoxyl, therefore, was continued, and vaccine treatment abandoned.

Patient went "on leave" from Sept. 3rd to 10th, and was not seen again by me till the 14th. Then patches on forearms were quite healed, and nodule on lip gone, with new skin of a faintly purplish colour formed where latter had been; but two small fresh pustules were present on left wrist, which patient thought might develop. Not having taken any stannoxyl for four days, enough was given to him for five or six days' further treatment. Culture from pustules on wrist showed presence of staphylococci but no diphtheroid organism found. Seen again Sept. 21st, condition cured, and there has been no return since.

In all patient took some 140 tablets of stannoxyl; and during treatment he was obliged to take salts ($MgSO_4$) every other night to keep bowels open.

That stannoxyl appears, therefore, to afford a sure and efficient method of general treatment for such staphylococcal infections as furunculosis and acne would seem to be proved by the above cases, confirming as they do the results already obtained in France by Frouin and his co-workers.

The rapidity with which, in these diseases, the infection comes under control is suggestive that, here at least, there is in the metal a curative agent at work, acting probably as in the corresponding anaerobic in vitro experiment of Frouin and Grégoire; in which case it would be by producing a soil unfavourable for the growth of staphylococci. Its effect on the growth of staphylococci under aerobic conditions in vivo, I propose shortly to deal with in a further paper on the treatment of the "mixed infection" of pulmonary tuberculosis by stannoxyl.

My best thanks are due to Major L. O. Betts, A.A.M.C., Major J. B. Norris, A.A.M.C., and Captain B. Brooke, A.A.M.C., for kindly sending to me and placing at my disposal most of the cases dealt with in the foregoing study.

References.—1. Albert Frouin: C. R. Soc. de Biologie, 1910, lxviii., 915 (Mineral Media and *B. tuberculosis*); Ibid., 1912, lxxii., 1034 (Vanadium on *B. tuberculosis*); Ibid., 1912, lxxiii., 640 (Rare Metals on *B. tuberculosis* and *Asp. niger*); Ibid., 1913, lxxiv., 196 (Lanthium Sulphate and *B. subtilis*); Ibid., 1913, lxxiv., 282 (Uranium and Thorium Salts on *B. tuberculosis*). Albert Frouin and Mlle. S. Ledebt: C. R. Soc. de Biologie, 1912, lxxii., 981 (Sodium Vanadate and *B. pyocyaneus*). 2. Albert Frouin and R. Grégoire: C. R. Acad. des Sciences, 1917, clxiv., 794 (Tin and Staphylococcus). 3. R. Grégoire and Albert Frouin: Bull. Acad. de Méd., May 20th, 1917. Hudelo: Soc. Méd. des Hôp., May 25th, 1917, p. 705. Phocas: Soc. de Chirurgie, July 3rd, 1917, p. 1458.

A CASE OF SPLENOMEGALY TREATED BY SPLENECTOMY,

WITH REPORT ON CONDITION OF THE BLOOD AND SPLEEN.

BY G. R. FOOTNER, F.R.C.S. ENG.,
MEDICAL INSPECTOR, SUDAN GOVERNMENT;
AND
R. G. ARCHIBALD, M.B., CH. B. EDIN., D.S.O.,
CAPTAIN, R.A.M.C.
(*Pathologist, Wellcome Tropical Research Laboratories*).

THE patient, a native girl about 14 years of age, was admitted to hospital complaining of weakness, shortness of breath, and slight continual abdominal pain of five years' duration. She denies all previous illness, but probably in common with all riverain people had been subject to slight repeated attacks of malaria. During her stay in hospital before the operation no jaundice or hæmorrhages occurred, and no history could be obtained from her or her parents that she had ever suffered from either of these complications. She was anæmic, as judged by the colour of the conjunctivæ, but not emaciated, her appetite was poor, and she was apathetic. On examination of the abdomen the spleen could be felt to extend 17 cm. and the liver 6 cm. below the costal margin. Neither organ was tender. There was no ascites or œdema of the legs and no enlargement of the lymphatic glands. The urine contained neither albumin nor sugar. Slides of the peripheral and splenic blood were examined, but no malaria or kala-azar parasites could be discovered. The patient suffered from irregular intermittent fever, as shown in the chart.

About one month after admission the spleen was removed. An incision 7 inches in length was made through the left rectus, and after division and ligature of one small omental adhesion the spleen was brought out of the wound and turned forwards and to the right. The pedicle was thus exposed from behind. Three ligatures were sufficient for the pedicle. Unfortunately, the tail of the pancreas, which was closely adherent to the back of the pedicle, was temporarily included in a ligature—an accident which delayed recovery. There was very little loss of blood. The anterior wound was closed, a rubber drain being left in the loin. The spleen weighed 907 gm.

There was a good immediate recovery from the operation, the wounds healing without suppuration, and the conjunctivæ regained some colour three days later. A week later wasting was noticed, and at the same time undigested food appeared in the fæces. This condition lasted for three weeks, during which time the patient gradually wasted, but later she began to improve, and by the time she left the hospital, two weeks later, had put on flesh again. She was seen six months after the operation, and had then lost her apathetic look and dyspnœa on exertion. The changes and the improvement in the condition of the blood are noted in the report by Captain Archibald.

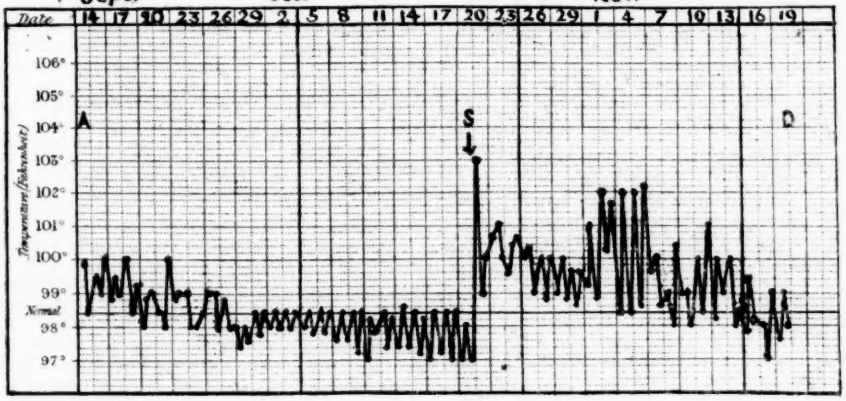


Chart of a case of splenomegaly treated by splenectomy. A, admission; S, splenectomy; D, discharge.

Report on Blood Films and Portion of Spleen.

Blood films.—A. Before operation. No malarial or other parasites present, nor was malarial pigment found. The blood showed evidence of destructive changes by the presence of microcytes, megalocytes, poikilocytes, and "shadow" corpuscles. Neither normoblasts nor myelocytes were present. There was an obvious leucopenia, so much so that it was only possible to carry out a differential count of 250 leucocytes on the one blood film sent for examination. This count gave the following percentages:—

Polymorphonuclear leucocytes	72·4	Large lymphocytes	8·0
Small lymphocytes	10·4	Large mononuclears	6·8
		Eosinophiles	2·4

B. Blood film taken seven days after the operation of splenectomy. There was a well-marked polychromatophilia, and microcytes and megalocytes were observed. The most noteworthy features in these films were the large numbers of normoblasts present. The apparent leucopenia noted before the operation had entirely disappeared. A differential leucocyte count gave the following percentages:—

Polymorphonuclear leucocytes	75·6	Large mononuclears	15·6
Small lymphocytes	2·4	Eosinophiles	0·4
Large lymphocytes	4·8	Basophiles	5·2

C. Blood films taken one month after the operation of splenectomy. These films showed a marked diminution of polymorphonuclear leucocytes and an increase of large mononuclears and eosinophiles. A differential leucocyte count gave the following percentages:—

Polymorphonuclear leucocytes	45·6	Large mononuclears	17·2
Small lymphocytes	9·2	Basophiles	4·8
Large lymphocytes	6·8	Eosinophiles	16·4

D. Blood film taken six months after the operation. A fair degree of poikilocytosis was evident and a few microcytes and normoblasts were found. The differential leucocyte count showed that there was still a diminution in the number of polymorphonuclear leucocytes, and also an increase of the small lymphocytes. Compared with the previous count, the numbers of large mononuclears and eosinophiles had diminished. The following percentages were obtained from a count of 500 leucocytes:—

Polymorphonuclear leucocytes	53·0	Large mononuclears	7·0
Small lymphocytes	24·0	Basophiles	5·0
Large lymphocytes	6·0	Eosinophiles	5·0

Spleen.—Sections taken from a portion of this organ were stained with hæmotoxylin-eosin and by Leishman's and Giemsa's stains. Seen under a low power the sections showed that a general fibrosis affecting the organ was present. The capsule showed evidence of slight thickening. Scattered throughout the splenic reticulum were islands of fibrous tissue corresponding in some areas to what had formerly been Malpighian corpuscles, and young connective tissue cells were observed among the lymphoid elements; the latter showed no hyperplasia. Pigment was absent. The vascular sinuses were not dilated nor were hæmorrhages noted. Neither malaria nor leishmania parasites were found, nor was there any evidence of tuberculosis.

Remarks.—The case is of interest, inasmuch as it represents one of the splenomegalies of obscure origin not infrequently met with in the Sudan. Examination of the films taken before the operation showed there was an obvious leucopenia, a fact which suggested a protozoal infection and, at the same time, excluded the possibility of the case being either splenomedullary or lymphatic leukæmia. As already mentioned, however, protozoa were not found either in the peripheral blood films or in the sections taken from the spleen. With such negative evidence as regards the etiology, it would appear feasible to consider this case as representing a type of chronic splenic anæmia closely allied to Banti's disease and the splenomegaly with hepatic cirrhosis found in Egypt.

Khartoum.

MUSCULAR RHEUMATISM: ITS DIAGNOSIS AND TREATMENT BY PHYSICAL MEANS.

BY FRANK RADCLIFFE, M.B., CH.B. EDIN.,

MEDICAL OFFICER IN CHARGE OF TREATMENT DEPARTMENTS, COMMAND DEPOT, HEATON PARK, MANCHESTER; AND CONSULTING BALNEOLOGIST, ALDER HEY ORTHOPÆDIC HOSPITAL, LIVERPOOL.

SINCE the opening of the Department of Hydrotherapy in Heaton Park Camp at the end of June, 1916, 452 cases of rheumatism have been treated, of which 44 per cent. have been discharged ready for hardening by physical training and route marching. During this period several features have presented themselves which will, I think, interest those who have this form of treatment at their disposal.

This short article has been written with three main objects. First, to record the work done and the treatment employed here; secondly, to draw attention to, and possibly stimulate further investigation into, the nature and pathology of the "crystalline deposits" described below; and, thirdly, to interest the profession in the possibilities, not generally realised, of this form of treatment.

Nature of Cases.

Rheumatism has always been regarded as a very general term applicable to aches and pains in various structures of the body, particularly muscles, fibrous tissues round joints, synovial membranes, tendons, &c. It is an extremely difficult condition to diagnose by physical examination in the subacute and chronic forms. The so-called muscular type is by far the most common variety both in the Army and in civil life.

During the war one of the worries of a medical officer has been, and is, the diagnosis of muscular rheumatism in its mild form. A man complains of lumbar pain; he is unable to bend his back beyond a certain angle; or he may be unable to shoulder a rifle on account of pain in the trapezius or deltoid; or he may say that he is unable to march on account of pain in the legs; or he asks to be excused puttees because of the pain experienced by the wearing of them. The first question a medical officer asks himself is, "Is this a genuine case?" The man may have pain, yet it cannot be proved by physical examination, or he may not have pain and be a malingerer. Whether preparing for active service, while on active service, or when invalided, the case of muscular rheumatism soon makes an appearance before the doctor. The same applies in civil life: cases of rheumatism form a large percentage of the general medical practitioners' lists.

The commonest forms of the muscular type are a myalgia, myositis, or fibrositis. There may or may not be history of previous attacks. Sometimes, but not frequently, there is a history of acute rheumatism, either recently or many years ago. This condition, in my opinion, is due to an inflammation in the fibrous tissue causing a neuralgia in the terminal nerve filaments. It is agreed that the sheaths of muscles, tendons, periosteum, ligaments, &c., are all liable to be attacked. But as a consequence of the inflammation there is no organic change of tissue. All that results is a thickening. The movements, beyond a transient stiffening, are not impaired permanently.

At Heaton Park there have been, and are, a large number of patients who have developed rheumatism following enteric, dysentery, trench fever; the latter is very common. Many complain that the rheumatism appeared after the symptoms of the primary infection had disappeared; others have a history of previous attacks. Lastly, and most important, rheumatism following long exposure in trenches, periods in wet places, and remaining in the same clothes for days or weeks. These cases are sometimes definitely subacute rheumatism following acute rheumatism.

Treatment.

The method of treatment employed is as follows. The patient is first given a sea-salt bath at a temperature of 98° F. for 10 to 15 minutes. This is followed by a douche for three minutes at 100° F. A powerful jet is directed on the painful region till a well-marked local hyperæmia is produced. The patient is then ready for what I consider the most important part of the treatment—namely, massage and manipulation.

Four of the masseurs employed in my department are blind. Three of these were blinded in the present war and were trained in massage while resident at Sir Arthur Pearson's hostel at St. Dunstan's. The fourth has been blind for several years and is an old and experienced hand at massage. His sense of touch is developed to an extraordinary degree, and I noticed that dealing with these rheumatic cases, especially those complaining of general pain in the limbs or the spinal region, he made his patient cry out with pain. On investigation I found that this masseur could isolate painful points. For instance, if a man complained of pain in the muscles of a lower limb the masseur could localise by running his fingers over the limb four or five painful "spots," as he called them.

After some weeks of constant practice I was able myself to localise the painful areas. By passing the hand slowly over the part, palpating not too deeply, these areas can be distinctly felt, and by constant practice with many cases it becomes mechanical. These "painful spots" vary considerably in size and nature. Some are quite small and rounded and about the size of a lentil. Others are as large as a bean. Other areas show distinct fibrous bands running along the course of a muscle. Some of the deposits are fairly soft and can be readily dispersed by deep massage. Others are very tough and almost of a consistency of gristle and require prolonged treatment before absorption takes place.

Another variety of great interest is the "crystalline deposit." These deposits are not found in every case, and in my experience are rather the exception than the rule. They may co-exist with the ordinary form of deposit—that is, both forms may be found in the same patient. These areas are exactly like a nest of small crystals lying at various depths, depending on the site. Those nearest the surface can, of course, be most readily palpated. They feel exactly like soda crystals and can be definitely broken up by deep manual pressure.

I would lay stress on the importance of the massage being properly applied. The ordinary so-called massage does not, as a rule, have the slightest effect on these deposits. Quite a large number of our patients have been treated by hydrotherapy and massage for weeks or months at other centres without satisfactory results. The form of massage has been the ordinary kind extended over the whole limb or limbs without concentration on the affected tendon or muscle. We find that after a period of three to four weeks' treatment by hydrotherapy and massage, consisting of deep thumbing movements on these areas followed by deep kneading and upward pressure, the deposits, which can be felt to break up, have disappeared and the pain has vanished. A great saving of time and labour is effected, for the whole limb need not be massaged until the end of the daily process, when the clearing away of the effete products is desired

Crystalline Deposits.

Whether these crystalline deposits are an early stage in the development of the fibrous variety or whether they are produced by degenerative changes is a matter of conjecture.

Up to the present time, after several months of constant observation and treatment of these cases, the aponeurotic sheaths appear to be the most frequent sites, and an analysis of cases shows that the principal areas affected are: (1) In the flexor brevis hallucis; (2) below the external malleolus—sometimes inflamed; (3) middle third of tibialis anticus; (4) the head (posterior aspect) of the fibula; (5) middle third of the rectus femoris (very common); (6) the sacro-iliac synchondrosis; (7) the tuber ischii; (8) the origin of the erector spinæ; (9) the erector spinæ muscles—various sites; (10) the rhomboids, serratus magnus, and trapezius (upper fibres mostly); (11) second and third cervical vertebræ; (12) coraco-brachialis; (13) head of radius; (14) supinator longus.

It is interesting to note that they have not been found in the triceps and biceps, and extremely rarely in the semitendinosus and semimembranosus. These crystalline deposits may be chemical, the result of fatigue or auto-intoxication, or they may be bacteriological, only their isolation and analysis can decide.

A few months ago a case which presented very marked deposits was sent to the department for treatment.

The right leg, both in the thigh and calf muscles, was affected, and the pain experienced by the patient was severe. He could hardly bear the most gentle pressure. Examination revealed that there was a large nest of these crystal-like structures in the middle third of the tibialis anticus muscle. There were several smaller areas in other parts. I presented the case to several of my medical colleagues for their opinion. They informed me that the condition was quite new to them.

It was decided to make an incision directly over this large nest of crystals and if possible remove them. An incision was made over the area (Captain A. W. T. Whitworth, R.A.M.C., kindly performing the operation), and the aponeurotic sheath of the tibialis anticus muscle was exposed. The crystal-like structures could be felt in a pocket or small cavity below the level of the sheath, and as the surgeon removed the mass he could distinctly feel that the small foreign bodies were hard and brittle. The mass was about the size, including fat and connective tissue, of a marrowfat pea.

This mass was placed on a microscopic slide, but, to our surprise, within two minutes the crystal-like structures had disappeared and only the soft tissue could be felt in the forceps. The piece of tissue was immediately transferred to a test-tube and dispatched to the pathological laboratory for chemical and pathological examination. The following is a copy of the report:—

"The material was found to consist of a mass of fat cells lying in a coarse stroma of connective tissue, fibrin, and some elastic tissue. No crystals were found. No evidence of an old hæmorrhage was discovered. The examination has given no clue to the symptoms observed."

Were these crystals volatile?

Heaton Moor, Stockport.

Clinical Notes:

MEDICAL, SURGICAL, OBSTETRICAL, AND THERAPEUTICAL.

BOMB WOUND OF ABDOMEN:

AN EXAMPLE OF PERITONEAL RESISTANCE.

BY D. P. D. WILKIE, M.CH., F.R.C.S. EDIN.,
ACTING STAFF SURGEON, R.N.V.R.; R.N. HOSPITAL SHIP, "ST. MARGARET OF SCOTLAND."

THE following case appears to be worthy of record as illustrating the remarkable power of the peritoneum to resist infection of traumatic origin when the element of shock is successfully combated.

S. H., aged 32, leading seaman, was acting as coxswain of a motor launch at 6 P.M. on August 18th, 1917, in a harbour in the Eastern Mediterranean when a bomb dropped by hostile aircraft exploded 15 yards from the launch. A fragment of bomb, 1¾ in. by ¾ in. by ¼ in., of irregular jagged outline, struck him in the abdomen. Entering in the right half of the epigastrium, it came out in the right flank, and then embedded itself in a wooden bulkhead from which it was recovered later. He was laid on the bottom of the launch bleeding freely, and on lifting up his "flannel" it was seen that numerous coils of intestine had escaped from the posterior wound. At 6.50 P.M. he was brought alongside the hospital ship. It was then seen that between 5 and 6 feet of small intestine had prolapsed and become partially strangulated, the intestine being congested and œdematous, and there being numerous hæmorrhages into the mesentery. A knuckle of transverse colon and omentum projected at the anterior wound. His clothes were soaked with blood and, as the weather was hot, stormy, and dusty, only relatively clean. As he was writhing in pain and tending to force more intestine through the wound he was anæsthetised in the launch, then hoisted inboard and taken to the theatre.

Operation (one hour after injury).—The prolapsed intestine, which was later found to be the upper jejunum, felt thick and sodden but had not lost its normal gloss except in a few places, and although there was obvious soiling it still showed definite though sluggish muscular response to stimulation. The coils were rapidly washed with eusol and covered with swabs out of hot saline. The entrant and exit wounds of the abdominal wall, which were four inches apart, were then joined by an incision. It was then seen that there was but one wound of the parietal peritoneum, 5 inches long; there was no sign of any tear of the intestine or mesentery, but the lower margin of the right lobe of the liver had been lacerated and there were compound fractures of the ninth and tenth ribs in the anterior axillary line. The hæmorrhage was coming chiefly from the torn intercostal arteries, which were thereupon ligatured. The patient at this stage became somewhat collapsed under the anæsthetic, and therefore only a very perfunctory cleansing of the prolapsed intestine could be carried out before replacing it. No effort was made to empty the peritoneal cavity of blood, but after spreading the omentum below the wound the peritoneum was closed completely. The edges of the wound in the abdominal wall were excised and the wound stitched up, a small rubber drain being left in at its posterior angle. For 48 hours after the operation the patient suffered from abdominal distension and there was generalised abdominal tenderness, but, absorbing large quantities of saline per rectum, he quickly got over the initial shock, and with the help of hypodermic injections of eserine gr. 1/150, small doses of calomel by the mouth, and finally a turpentine enema the bowels were got to move on the third day. From this time onward progress was uneventful; he was on deck on the tenth day, the wound healed per primam, and he returned to duty on his ship six weeks after the injury.

The case is of interest partly from the fact that a jagged fragment of bomb should have torn the parietal peritoneum so extensively without wounding any of the hollow viscera, but chiefly because of the evidence it affords that in dealing with such cases speed and the avoidance of shock are more important factors than elaborate efforts to cleanse the exposed and soiled peritoneal surfaces, and that if the circulation and general condition of the patient can be maintained the peritoneum has wonderful powers of dealing with infection.

I wish to express my thanks to Surgeons W. A. McKerrow and W. G. Wyllie for their skilful help in dealing with the case.

CASE OF THREATENING SEPSIS OF KNEE-JOINT ABORTED BY INJECTION OF FLAVINE.

BY W. HENRY HILLYER, M.D. DURH.

THE following case seems worth reporting as evidence of the value of flavine in cutting short a commencing sepsis where circumstances contra-indicate free incision and drainage.

The patient, a domestic servant, aged 18, first seen on Sept. 29th, 1917, gave a history of sudden pain and swelling of the right knee-joint, commencing the previous evening. Had been perfectly well up to that time—no history of any wound, blow, strain, or other injury. On examination the knee was found greatly swollen, the joint distended with fluid, and all outlines lost. The whole joint was slightly tender and very painful on movement. There was a well-defined acutely tender spot over the inner edge of the head of the tibia, and the general appearance of the joint suggested an acute synovitis such as follows a displacement of a semilunar cartilage, but no evidence of such an injury could be made out. Temperature 104° F.

Under lead fomentations, rest in bed, and sod. salicyl. gr.x. 4tis hor. the swelling subsided considerably, but the tender spot persisted, and the temperature continued to rise to 102° or thereabouts each evening.

On Oct. 4th patient was admitted to the Queen Victoria Cottage Hospital, East Grinstead. The knee was painted with iodine and kept at rest with sandbags, and the sod. sal. continued. Temperature fell on the morning of the 5th and did not rise above 98·6° that day, but on the 6th, 7th, and 8th it rose to 99·4°, 99·0°, and 99·6°, the condition of the joint remaining unchanged.

On Oct. 8th she was seen by Major Cecil Rowntree, consulting surgeon to the hospital, who aspirated the knee-joint and drew off 60 c.c. of turbid flaky fluid, not definitely purulent. He advised keeping the joint absolutely at rest on a McIntyre's splint, continuing the sod. sal. and aspirating at intervals in the hope that it might not be necessary to open the joint. The aspiration greatly relieved the pain and entirely abolished the tender spot over inner edge of head of tibia. Temperature continued to run a hectic course for the next four days, reaching 101° on the 11th and 100·4° on the 12th. On the 13th and 14th it remained normal, but on the 15th it reached 100·6° and on the 16th 100·2°, with return of pain and tenderness and increase of swelling.

On Oct. 16th 40 c.c. of fluid were withdrawn with less marked relief of symptoms, temperature continuing to rise to between 100° and 101° each evening. The fluid was examined by Dr. Cavendish Fletcher, who reported as follows:—"The fluid contains a good deal of pus and a little blood. Bacteria are not numerous, and comprise short Gram-positive bacteria of diphtheroid type. These have not grown in culture. A

search for gonococci and tubercle bacilli has yielded negative results."

On Oct. 21st the joint was aspirated again and 34 c.c. removed. This produced great relief, and the temperature range continued lower, being normal in the mornings and not rising above 99·6° until Oct. 27th, when it ran up to 100·8°, with more swelling than at any time since the first three days.

On Oct. 27th 66 c.c. were drawn off, and the fluid appeared more decidedly purulent and showed large numbers of lymphocytes under the microscope. The temperature remained persistently high, ranging between 99·4° and 101° for the next 48 hours. Major Rowntree then suggested injecting flavine, still wishing to avoid opening the joint if possible. 30 c.c. of fluid were withdrawn and 30 c.c. of flavine (1-1000 in normal saline) were injected. The temperature fell to normal on Oct. 31st, and has not since risen above 99°. Since Nov. 8th it has not risen above normal. All tenderness, pain, and swelling have gradually disappeared. The splint was removed for half an hour daily, and passive movements commenced on Nov. 15th.

On Nov. 22nd the splint was finally removed. The knee was forcibly bent, full flexion being obtained. Some slight adhesions were felt to give way, and movement is now normal.

East Grinstead.

A CASE OF CUTANEOUS ANTHRAX IN MAN PRESENTING MULTIPLE LESIONS.

BY WILLIAM T. G. DAVIDSON, M.B., CH.B. GLASG., D.P.H. CAMB.,

SENIOR ASSISTANT PHYSICIAN, CITY OF GLASGOW FEVER HOSPITAL, RUCHILL.

A SEARCH of the literature has revealed the fact that the occurrence of multiple lesions in cutaneous anthrax is very uncommon. In a series of 65 cases occurring in 1915–16 Coutts[1] does not record any having more than one lesion. Osler and Macrae[2] state that the lesion is usually single, though two or even three points of inoculation have been observed. According to the "Encyclopædia Medica"[3] cases may occur in which two, or even more, malignant pustules may develop simultaneously. The following case, inasmuch as the lesions were multiple and did not occur simultaneously, presents elements of interest, therefore, in those respects.

"A" was employed on an estate in the country, and as he had some previous knowledge as a butcher he was asked to assist at the slaughtering of an animal thought to be suffering from inflammation of the bowels. He assisted to kill, bleed, and skin the animal, the carcass being removed to the dead-meat market. There it was suspected that the cause of the disease was anthrax, and this was subsequently confirmed. Moreover, a dog which had drunk some of the animal's blood and a second cow died later of anthrax.

Meanwhile "A," four days after the slaughtering of the animal, had developed a "pimple" on the back of his left hand. Three days after the appearance of this first lesion another had appeared on the right forearm. Having heard of the diagnosis of the disease in the animal, "A" became alarmed at the possibility of these lesions being anthrax also, and on the following day consulted his own doctor, who advised him to attend the infirmary in the neighbouring town. He attended the infirmary on the same day, when the disease was diagnosed as anthrax, and he was immediately transferred to this hospital.

On admission there was found a well-developed malignant pustule on the dorsum of the left hand, a central depressed necrotic area surrounded by a ring of small vesicles, with considerable inflammatory œdema over the back of the hand. Itchiness was a marked feature, but there was only slight pain, and the lymphatic vessels and glands did not appear to be affected. About halfway up the right forearm and over its anterior and ulnar aspect there was another similar though smaller lesion presenting the same clinical appearances. There was a smarting feeling present, itchiness, only slight pain and very little œdema.

On the day of admission the patient received 20 c.cm. of Sclavo's serum, and both pustules were excised and the wounds dressed with antiseptic dressings. The next morning a small papule had appeared over the anterior and ulnar aspect of the left forearm and about halfway up. This was accompanied by the same symptoms as were present with the other two, and it also was excised.

There was no pyrexia during the course of the illness from the time of admission here, and the general health was unaffected.

From the first two pustules *B. anthracis* was obtained in culture, but in the case of the last one no bacteriological examination was made, as the excised portion had been, unfortunately, destroyed. The first two lesions were undoubtedly malignant pustules, and it can be fairly definitely assumed that the third was also, because of its characteristic clinical appearance and of the fact that the subjective symptoms were the same in this one as the patient had experienced with the other two.

The patient made an uneventful recovery.

The foregoing case illustrates certain features of malignant pustule which appear, as far as can be ascertained from the literature, to be of rare occurrence in the disease.

The presence of multiple lesions is capable of explanation in several ways.

Direct infection may have occurred in the three places while the patient was in contact with the diseased animal. Lesions produced in this way tend to manifest themselves simultaneously, whereas in this case the lesions did not do so. The clinical appearances of the three lesions showed them to be at different stages of development. The incubation periods of the three pustules would tend to preclude the possibility of direct infection with the bacillus at the same time. According to Muir and Ritchie[4] and Osler and Macrae[2] the incubation period of a malignant pustule is from one to three days after infection takes place. In this case the first pustule appeared four days after infection; the second pustule, however, did not appear until seven days, and the third not until nine days after exposure to infection.

A second possibility is that the patient auto-inoculated himself at different times by rubbing and scratching the first lesion on account of the itching, and thereby transferring some of the infection to the other two places. Questioned as regards this, the man appears to have taken considerable precautions to clean his hands and arms after the slaughtering of the animal, washing them thoroughly. When the so-called "pimple" appeared he dressed it with a lysol dressing, and he denies ever having rubbed or scratched the part.

There remains, therefore, only one, and what would appear to be the most likely, mode of infection. After the slaughtering of the animal, at which he worked with his shirt sleeves rolled up to the elbow, he did not remove any of the clothing he had on at the time until seven days afterwards. It is therefore possible that some of the infection, probably in the form of spores, remained on the shirt he wore at the time for several days without producing any effect, until, after gaining entrance through the epidermis by some minute abrasion or cut in the skin, the spores developed rapidly into bacillary form, and produced a second and a third lesion. That this may happen is noted by Allbutt and Rolleston.[5]

The fact of the absence of constitutional symptoms—e.g., pyrexia, &c., and of the general absence of pain, though remarkable under the circumstances and indicative of high resistance to the disease, is by no means uncommon[6 7] as long as the lesion remains local.

References.—1. Coutts, Dr. F. J. H.: Report to Local Government Board on an Inquiry into Cases of Anthrax (1917). 2. Osler and Macrae: A System of Medicine (1915), p. 644. 3. Encyclopædia Medica (1901), p. 256. 4. Muir and Ritchie: Manual of Bacteriology, 5th edition, p. 342. 5. Allbutt and Rolleston: System of Medicine (1906), vol. ii., part 1, p. 243. 6. Ibid., p. 244. 7. Osler and Macrae, p. 645.

ROYAL SOCIETY OF ARTS LECTURES.—The arrangements for meetings at the Royal Society of Arts (John-street, Adelphi, W.C.) during January and February include a lecture on the Manufacture of Margarine in Great Britain by Sir William G. Watson, chairman of the Maypole Dairy Company, on Jan. 30th; one on the Development of the Mineral Resources of the Empire, by Professor W. Frecheville on Feb. 6th; and one on the Relations between Capital and Labour—Reasonable Hours, Co-partnership, and Efficiency, by Lord Leverhulme on Feb. 13th. The lecture hour in each case will be 4.30 P.M.

DOCTORS OF MILITARY AGE IN IRELAND.—For the past nine months the Cashel board of guardians have been petitioning the Local Government Board to sanction the appointment of Dr. Patrick Stokes as medical officer of the Fethard Dispensary District. Sanction has been refused on the ground that Dr. Stokes is of military age and eligible for service with the R.A.M.C.; he is an international footballer. The guardians have now decided to advertise for a temporary medical officer and have asked the Local Government Board to sanction the appointment of Dr. Stokes as medical officer in charge until the date of the election, at a salary of £4 4*s.* per week.

Reviews and Notices of Books.

1. *Radiography and Radio-Therapeutics.* By ROBERT KNOX, M.D. Edin., M.R.C.S. Eng., L.R.C.P. Lond., Honorary Radiographer, King's College Hospital; Director, Electrical and Radio-therapeutic Department, Cancer Hospital, London. Vol. I: Radiography. Second edition. London: A. and C. Black, Limited. 1917. Pp. xx.-386. Price 30*s.* net.
2. *Röntgen Diagnosis of Diseases of the Alimentary Canal.* By RUSSELL D. CARMAN, M.D., and ALBERT MILLER, M.D., both of the Mayo Clinic. London and Philadelphia: W. B. Saunders Company. 1917. Pp. 558. Price 25*s.* net.

1. IN reviewing in THE LANCET of May 29th, 1915, the first edition of Dr. Knox's book we predicted the success which has been realised. The rapid growth of the subject as a whole, and especially of that part bearing on the examination of wounds and injuries received in war, has necessitated the issue of the present edition in two volumes, of which the present volume under review is as large as the original whole. The preparation of a complete work on an extensive and highly technical subject is attended with considerable difficulty, and we are happy to note that the criticisms in our previous review now no longer apply. The illustrations are better and more abundant, and the subject of radiography in war-time has been treated with the thoroughness which characterises the work as a whole. The special advances relating to disorders of the thoracic and abdominal cavities are fully dealt with and well illustrated. Dr. Knox's book may justly claim to be the standard British work on radiology, and will be found as helpful to the advanced radiologist as to the beginner.

2. The subject of this volume, by Dr. R. D. Carman and Dr. Albert Miller, is one of the later applications of the X rays in the investigation of disease, but one that has recently undergone rapid development, with the result that at the present time it occupies a very important position. The writing of a complete treatise on a subject in rapid evolution is a well-nigh impossible feat which has almost been achieved in the present instance; the careful selection of all that matters from the writings of others, and the treatment of such material in relation to vast experience gained in the Mayo Clinic, have produced a work of genuine importance in the progress of medicine. The arrangement is in the form of a series of monographs, each complete, but forming links in a chain. Apparatus is described only so far as it has proved of service in the authors' own experience, and the chapter on the interpretation of results is one that will repay close study. The various parts of the digestive system are taken in order, commencing with the œsophagus, and special attention should be given to the chapters on duodenal ulcer, intestinal stasis, and appendicitis. In dealing with these and other equally important matters the authors show a wise judgment and sense of proportion. The illustrations are worthy of the text, and are presented in their appropriate place. The book will prove a valuable work of reference to all medical men, whether radiologists or not.

1. *The Principles and Practice of Dermatology.* By WILLIAM ALLEN PUSEY, M.D. Third edition. With 54 plates and 466 illustrations. London: Appleton and Co. 1917. Pp. 1243. Price 30*s* net.
2. *Diseases of the Skin*: For the Use of Advanced Students and Practitioners. By HENRY STELWAGON, M.D., Ph.D., Professor of Dermatology, Jefferson Medical College, Philadelphia. Eighth edition. With 356 illustrations and 36 coloured and half-tone plates. London and Philadelphia: W. B. Saunders Company. 1917. Pp. 1309. Price 28*s.* net.

1. THE formation of the venereal clinics has developed an increasing interest in dermatology, and within recent years so many small and large manuals have been published on this subject that the practitioner has a wide choice of well-written volumes containing lifelike illustrations. Dr. Pusey has realised more than many dermatologists the necessity of instruction in the various manifestations of syphilis. No fewer than 156 pages are devoted to this subject; 37 deal with its treatment. Clearness, thoroughness, and brevity characterise the descriptions on every page of this volume. We were somewhat surprised to find seborrhœa and pityriasis still described as they were before the publication of Sabouraud's masterly differentiation of these conditions in his "Maladies du Cuir Chevelu," but the treatment of these maladies is carefully entered into. Throughout the volume, indeed, treatment by drugs is considered in greater detail than is usual. Dr. Pusey gives instructions as to the dosage of ultra-violet rays; but where X ray is to be administered he is a vague and even, as in his advice respecting ringworm, an untrustworthy guide. This mars an otherwise excellent manual.

2. An eighth edition of this competent survey of skin diseases has appeared within 15 years—adequate testimony to its value and wide sphere of usefulness. The additional text and illustrations are up to the former high standard, and the references to dermatological literature throughout render the volume useful to the specialist as well as to the general practitioner. War experience in the East has rendered us familiar with the specific effect of tartar emetic in the treatment of Delhi boil—the sole omission we have detected in these up-to-date 1300 pages.

Morfologia Normale e Patologica dei Globuli Rossi. By Dr. NEGREIROS-RINALDI. With 10 coloured lithographs. Naples: Piazza Oberdan 13. Pp. 102. Price 10 lire.

THIS monograph deals solely with the red corpuscles of the blood, and is divided into four parts, embodying the work of most observers on the subject and the researches of the author himself. Part I., dealing with the origin of the red cells in the pre-hepatic, hepatic, and medullary stages of their development, sets forth the author's opinion that the presence of chromatinic substances morphologically similar to the typical "Jolly's body," does not authorise the conclusion that in the megalocyte the nucleus always disappears by a karyolytic process, the "body" being the ultimate residue, since it is often present in megaloblasts having a perfectly entire nucleus. And, further, that only in the pre-hepatic period have the megalocytes a duplex formation, intra- and extra-vascular, while in the liver the definite erythroblasts are derived exclusively from the interhepatic connective tissue—i.e., extra-vascular. With regard to the disappearance of the nucleus, whether by total expulsion or intracellular karyorrhexis, the author concludes that expulsion is the most frequent mechanism; next in frequency it occurs by a process of intracellular karyorrhexis with expulsion of the residual fragments, and most rarely by the same process with reduction of the nucleus to the form of Jolly's body and ultimate disappearance of the same. Part II. deals with the structure of the red cells in normal conditions, and while setting aside the controversy relative to the form and presence of an internal nucleoid body as having little clinical interest, the author asserts that with ordinary methods of examination mature normal red cells in the blood stream are homogeneously acidophile with a clear zone in the centre, in which, by special methods, the so-called internal nucleoid bodies may be demonstrated in many cases. Part III. deals with pathological modifications, such as anisocytosis, poikilocytosis, and changes in colour and persistence of the nucleus. The author's researches lead him to believe that basophile granulations must be considered to be the expression of a regenerative process, atypical in a fully developed animal, since such granulations are never met with in the bone marrow of an adult and healthy animal, but perfectly normal in the embryo. The nuclear origin of these basophile granulations is not admissible, whether from the whole nucleus or only from the parachromatin, since their presence in cells with perfect and permanent nucleus disposes of this theory. The most probable hypothesis is that while in normal conditions the basophilia of the erythroblast is at first more or less diffused in the plasma and subsequently disappears to give place to the orthochromatic phase of the mature erythrocyte, in certain pathological conditions the basic substance is differentiated and re-grouped in a granular form, thus giving rise to basophile granulations. In Part IV., which discusses the process of involution of the red cells, the author agrees with Pisani, who considers the blood platelets to be derived from the red cells, rather than with J. H. Wright, who excludes this mode of their origin. There are an ample bibliography and excellent coloured plates, and this monograph will prove interesting to those who make a special study of the development of the blood and its various aspects and changes in health and disease.

JOURNALS.

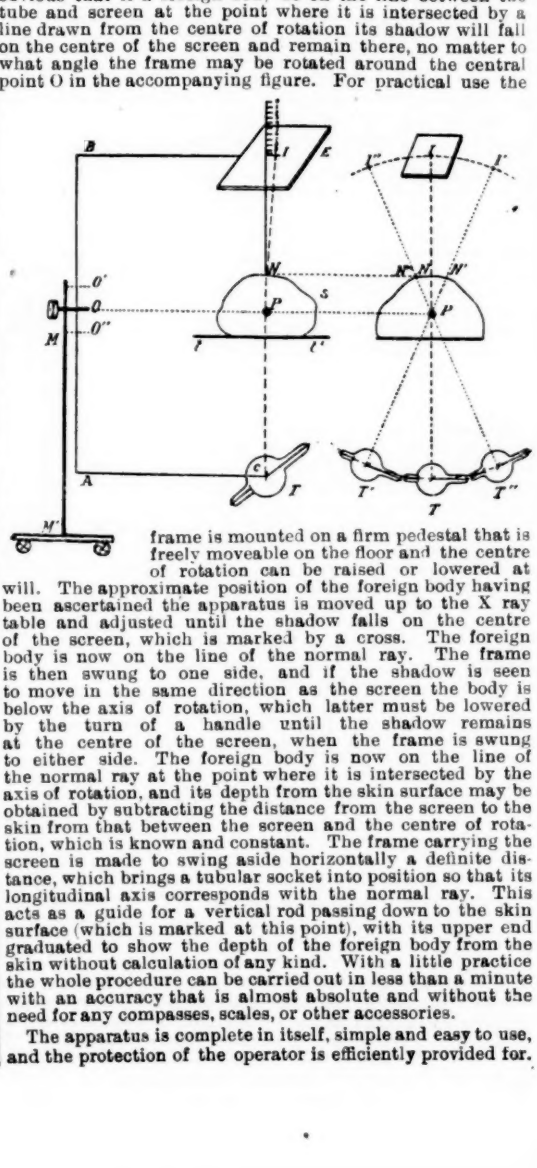
Parasitology. Edited by G. H. F. NUTTALL, F.R.S., assisted by EDWARD HINDLE, Ph.D. Vol. X., No. 1. November, 1917. Cambridge University Press. Price 12*s.* 6*d.* net.—"Bibliography of Pediculus and Phthirus," by G. H. F. Nuttall, F.R.S., is a list of all medical and zoological publications dealing with human lice, their anatomy, biology, relation to disease, &c., and prophylactic measures directed against them. This valuable compilation is made all the more useful by the addition of letters after each title indicating the nature of the contents.—"The Part Played by *Pediculus humanus* in the Causation of Disease," by G. H. F. Nuttall, F.R.S., consists of an account of the *P. humanus* in pathology, most attention being devoted to the louse in the etiology of typhus and relapsing fever, because of the importance of the two conditions and their prevalence in certain countries involved in the war. The most important discoveries relating to these two diseases are of comparatively recent date, and anyone desirous of obtaining a summary of the present state of our knowledge will find a useful account in the article under discussion. In addition the author describes the effects of louse infestation, based on experiments both on himself and a laboratory assistant. The larvæ and young lice were found to produce only transitory effects in the regions of the body where they were fed, but the adults produced more lasting effects. The arm of one of the subjects, which had been used as a feeding-ground for months, showed well-marked diffuse bronzing over the whole surface on which the lice had been fed. This melanodermia, as a result of pediculosis, has been noticed by several observers and, in marked cases, may extend to the mucous membranes, being visible in the mouth. This pigmentation has at times been mistaken for Addison's disease, but in the latter the melanodermia occurs in skin regions that are rich in natural pigment, and in addition there are no pedicular macules on the mucous membrane and no pediculi present.—"The Biology of *Pediculus Humanus*," by G. H. F. Nuttall, F.R.S., comprises the first three parts of an exhaustive monograph on this mischievous human parasite. The author has been unable to find any constant difference between the body louse (*P. corporis*) and the head louse (*P. capitis*) and prefers to regard them as, at most, merely racial forms of the same species, *P. humanus*, Linnæus. The two races are discussed separately, however, as under experimental conditions there are certain biological differences between them, especially with regard to the relative difficulty of raising these parasites from the egg. Part I. deals with the prevalence and modes of dissemination, and also includes interesting notes on the seasonal variation in the numbers of lice on man and the influence of climate. It has been observed that a slight increase of warmth has a deleterious effect on lice maintained on the person, and this may account for the statement that in Mexico body lice and also typhus fever are not found in the tropical parts of the country but only in the cooler plateaus. Part II. contains an account of the methods of raising lice experimentally, and in particular a description of a very ingenious method, known as the wristlet method, by the use of which the author has been able to raise large numbers of lice without any inconvenience beyond that caused by their bites. Part III. is concerned with the special biology, and contains not only summaries of all previous work on this subject but also much that is original and of considerable interest, especially on the life-history and feeding habits.—"Notes on Head and Body Lice and upon Temperature Reactions of Lice and Mosquitoes," by F. M. Howlett, contains observations on lice, showing that there is no constant difference between *P. capitis* and *P. corporis*. Thus head lice, when reared on the body, at first tended to migrate to the head; but this character was markedly modified in their offspring, some of which showed no definite tendency headwards. The chitinisation and colour of these individuals also approached that supposed to be characteristic of the body louse. With regard to temperature reactions the writer finds that all varieties of lice are excited to activity by warmth, and this reaction greatly facilitates the removal of head lice. Thus if a comb, warmed enough to be pleasantly hot to the hand, is used the lice become excited and run about, and are easily combed out of the hair.

New Inventions.

AN ITALIAN X RAY LOCALISER.

THE influence of the war on nearly every branch of medical work has been extensive, and in no branch is this more clearly seen than in the use of the X rays for the accurate localisation of foreign bodies. The number of methods suggested would be difficult to compute; most are very ingenious and many are complicated, but the simpler a method is, in principle and in practice, the better is its chance of surviving. Of the numerous methods we have examined it is doubtful if any one of them can compare with that designed and made by Mr. Carlo Baese, of Florence, and largely used in the Italian Army. The following description is taken from an article in the *Archives d'Électricité Médicale* by the editor, Professor J. Bergonié.

If we take a light frame of suitable size, shaped like the letter E, mount it on a horizontal pin at the position of the central tongue—which is not required—so that it is free to rotate in a vertical plane, and fix to the end of the upper arm a fluorescent screen, and to the lower one an X ray tube, we have all the essentials for understanding this very simple apparatus. The centre of the screen and that of the anticathode must be exactly opposite each other and the same distance from the vertical arm. It is obvious that if a foreign body be on the line between the tube and screen at the point where it is intersected by a line drawn from the centre of rotation its shadow will fall on the centre of the screen and remain there, no matter to what angle the frame may be rotated around the central point O in the accompanying figure. For practical use the



frame is mounted on a firm pedestal that is freely moveable on the floor and the centre of rotation can be raised or lowered at will. The approximate position of the foreign body having been ascertained the apparatus is moved up to the X ray table and adjusted until the shadow falls on the centre of the screen, which is marked by a cross. The foreign body is now on the line of the normal ray. The frame is then swung to one side, and if the shadow is seen to move in the same direction as the screen the body is below the axis of rotation, which latter must be lowered by the turn of a handle until the shadow remains at the centre of the screen, when the frame is swung to either side. The foreign body is now on the line of the normal ray at the point where it is intersected by the axis of rotation, and its depth from the skin surface may be obtained by subtracting the distance from the screen to the skin from that between the screen and the centre of rotation, which is known and constant. The frame carrying the screen is made to swing aside horizontally a definite distance, which brings a tubular socket into position so that its longitudinal axis corresponds with the normal ray. This acts as a guide for a vertical rod passing down to the skin surface (which is marked at this point), with its upper end graduated to show the depth of the foreign body from the skin without calculation of any kind. With a little practice the whole procedure can be carried out in less than a minute with an accuracy that is almost absolute and without the need for any compasses, scales, or other accessories.

The apparatus is complete in itself, simple and easy to use, and the protection of the operator is efficiently provided for.

THE LANCET.

LONDON: SATURDAY, JANUARY 19, 1918.

The Retirement of Sir Alfred Keogh and the Appointment of his Successor.

THE retirement of Sir ALFRED KEOGH from the duties of Director-General of Army Medical Services was announced at the beginning of the week, its imminence having been an open secret for some little time. Sir ALFRED KEOGH has been permitted to resume his duties as General Executive Officer of the Imperial College of Science and Technology and will be replaced at the War Office from March 1st next by Colonel T. H. J. C. GOODWIN, R.A.M.C. To Sir ALFRED KEOGH, on his return to civil duties which are bound up in an inextricable and important manner with the conduct of the war, one feeling will go forth, not only from his medical colleagues, military and civilian, and not only from all those officially concerned in the conduct of the war, but from every citizen of the Empire; and that feeling is made up of profound gratification for what he has done and of admiration for the way in which he has done it. It is needless to recall the well-known story how the universal conflagration found this country, with its colossal interests concerned indirectly, bound to support the equally colossal and direct interests of allied nations, but with land forces immeasurably too small to enforce the right upon those who had wilfully scouted treaties and rushed into a struggle for world empire. Recalled from his important civil post to the position which he occupied during and after the Boer War, Sir ALFRED KEOGH took charge of the Army Medical Services at home, working in touch with Sir ARTHUR SLOGGETT, who went out to France as Director-General with the British Expeditionary Forces. The immediate responsibilities that fell upon Sir ALFRED KEOGH were a mere prelude to those that followed. The numbers of the British Army, at first by splendid voluntary effort and later by conscription of gradually increasing severity, were increased in two years by eightfold, while our military plans took shape in Expeditionary Forces despatched for offensive or defensive purposes to Mesopotamia, Egypt and Palestine, Gallipoli, Salonika, and lastly, Italy. In these gigantic developments it was Sir ALFRED KEOGH'S business to find the medical officers to take charge of the health of the troops at home and on various fronts, and to collaborate with the military authorities on questions of supply, transport, hospital establishment, and hospital maintenance; and in no case was past experience of medical activities in connexion with real war able to afford a direct precedent for the new work. For the changes and chances of this war have been kaleidoscopic, and multifarious have been the directions in which new factors have come into being, or in which the unimportant points of the past have been turned into the urgent considerations of the present. And be it remembered that these transformations did not take place at separate intervals or in homologous regions; they often overlapped in their dates and presented problems asking for varying and sometimes mutually contradictory measures. For three years and a half Sir ALFRED KEOGH has held supreme position as adviser of the military authorities in such circumstances of terrible weight for the nation and of the deepest poignancy for him whose counsel was demanded. The general verdict throughout has been that he has borne the burden with unexampled courage and resourcefulness; that he has held the balance between the rights of long service and the claims of progressive learning with fairness; and that every question submitted to him, whether brought to his mind by the facts as they happened or officially introduced to him by others in possession of the details, has been answered with a single eye to the winning of the war. Humanity, business efficiency, consistency, and convenience have had their say in his conduct of the post of Director-General of the Army Medical Services, but none of them has ever been allowed to interfere with the grand resolve held by this nation that with the help of the Allies the war is to be won.

The appointment was announced in THE LANCET last week of Colonel T. H. J. C. GOODWIN as Deputy Director-General of Army Medical Services on the retirement of Sir M. W. RUSSELL. Colonel GOODWIN received his commission in 1893, and is therefore junior in rank and years to many officers over whom he has been promoted. His appointment is definitely one of selection, and for our part we welcome cordially the fact that this principle has been acted upon. We feel, also, that those who in this case may suffer a disappointment of perfectly legitimate hopes will acquiesce in the feeling that for responsibilities so onerous as those which the new Director-General must assume it was necessary to appoint a head who had proved himself by actual accomplishment during the conduct of the war to be possessed of the necessary qualities. We may be certain that Sir ALFRED KEOGH has expressed thorough confidence in the ability of his successor, who brings to the new post not only a fine general record of previous service, but special recommendations at this juncture for placing him where his individuality should tell. As long ago as 1897 Colonel GOODWIN acted as staff-surgeon in military operations on the North-West Frontier of India, where his services were specially mentioned and honourably recognised. During the present war his name has appeared in despatches, and decoration and promotion have borne witness to the value of his energies; but in particular, just as the United States are reaching the position of active and effective coöperation with the Allies, is it necessary to remember that to the medical and military authorities of the great western republic Colonel GOODWIN is favourably known. As Assistant Director of Medical Services to the British Recruiting Mission in America, he proved himself an effective instigator

of rapid and workmanlike preparation in the States for the huge medical task that lies immediately ahead. He showed himself both informing and tactful in the manner in which he approached our colleagues in the United States, being able to take the point of view of one who had worked on the field of battle from the beginning, and who therefore knew alike the value of what had been done and the directions in which it was necessary that in the future we should all do better. It is not the least of Colonel GOODWIN'S recommendations to his important post that he should have won the confidence, even the admiration, of the medical profession in the United States, whence already is proceeding to these shores and to France, the advance guard of an army of healing and prevention.

In the time that is coming the share which medical science will have in winning the war and in minimising the losses to civilisation brought about through its grievous influence will become more obvious to the general public. Under Sir ALFRED KEOGH almost every aspect of medicine in connexion with the war had to be realised by the imagination before it appeared in fact, and had to be considered while in a state of experiment before effective administration could give shape to any consequent measures. But now, in the fourth year of the war, scientific and clinical research are going hand in hand with the daily labours of the fighting fronts, while the methods not only for arresting evil and alleviating misery at the moment but for obtaining the best after-results among the injured material have become codified and placed in a position to work themselves out to better things. It will be Colonel GOODWIN'S magnificent task to carry on all this collated work with the zeal and absorption of those who have gradually brought it into being. He, like Sir ALFRED KEOGH, will have to hold the balance between conflicting policies and discordant interests, and we may be certain that his endeavours will be under the perpetual guidance of a resolute intent to win the war.

A Medical Man and a Lady Supervisor.

A SOMEWHAT unusual case, and a very serious one, of interference by a lady supervisor of an Approved Society in a matter concerning a medical practitioner on the panel and his insured patient was recently brought before the Denbighshire Insurance Committee by Dr. E. MOSS, of Wrexham. The facts narrated by Dr. MOSS on behalf of Mr. R. EVANS, a medical colleague practising, like himself, at Wrexham, were as follows. A female patient of Mr. EVANS was certified by him as suffering from rheumatism and was in receipt of sickness benefit from her society accordingly. A lady visitor of the society reported the woman for being out of doors late and her benefit was suspended, but was afterwards restored upon her expressing regret and promising amendment. After this had occurred a lady supervisor had an interview with her, and made a report to the society which included the statement that "the patient is supposed to be suffering from rheumatism, as appears on the medical certificate, but I find that she is suffering from syphilis." Dr. MOSS continued that the supervisor obtained an admission of an act of immorality from the woman, and learnt something from her which caused her to report further that "symptoms of syphilis appeared at a certain time." She also made an examination of her breast and the upper part of her arms. As a consequence, presumably, of remonstrance by Mr. EVANS, a medical referee was requested later on by the society to examine the insured person with the supervisor's report before him, and he reported to the effect that, in his opinion, she was not suffering from syphilis, but that her condition was as stated by Mr. EVANS. In the course of correspondence with Mr. EVANS, in which the society gave neither an apology nor any undertaking that such an incident should not occur again, the society referred to certificates by Mr. EVANS subsequent to the first one, in which he stated that the insured person was suffering from psoriasis as well as rheumatism. To have mentioned this at the outset, the society alleged, would have avoided the whole trouble, but Dr. MOSS explained to the committee that psoriasis was simply a skin disease, which, except under certain conditions, would not involve incapacity for work. Upon the facts summarised above a motion to refer the matter to the Welsh Insurance Commissioners was introduced by the chairman and carried. It is to be observed that the seconder of the motion referred to the case as the first complaint against an approved society with which the Denbighshire committee had had to deal. In comment, however, it may be pointed out that it is as grave a case of its kind as could well be brought forward. That the society should have instructed their supervisor to examine a medical practitioner's patient in the manner described is hardly conceivable, but if that lady exceeded her instructions, her conduct does not appear to have been repudiated by her employers. No doubt the Welsh Insurance Commissioners will give the matter their serious consideration; but both the lady supervisor and the Approved Society may be reminded that the statements made by the former were gravely defamatory both of the medical man and his patient, that they were without foundation, and that in the circumstances in which they were made it is, to say the least, doubtful whether in an action for defamation the communications would be held to be privileged.

THE LANCET, VOL. II., 1917: THE INDEX.

THE Index and Title-page to the volume of THE LANCET completed with the issue of Dec. 29th is now ready. Owing to the increasing shortage in the paper-supply, the Index will not be issued with all copies of THE LANCET, as was the custom prior to the War. Subscribers who bind up their numbers are requested to send a post-card to the Manager, THE LANCET Office, 423, Strand, London, W.C. 2, when a copy of the Index and Title-page will be supplied free of charge.

Annotations.

"Ne quid nimis."

THE TREATMENT OF STAPHYLOCOCCAL INFECTIONS OF THE SKIN.

AMONG the services which dermatology is able to render to general medicine are facilities for the study of pathological processes and of the action of remedies. The common complaints due to staphylococcal infection afford a particularly good field for the observation of the results of various methods which may be employed to combat microbic invasions. Experience has taught us that we may aim at the destruction of invading micro-organisms by different ways. We may attempt to do so by the direct application of parasiticides to the site of invasion, or by the introduction of the same sort of remedies by the mouth or by the blood stream, or we may try to enhance the natural fighting powers of the tissues and fluids of the body by some kind of stimulation. To the first of these methods, that of direct application of antiseptics, the objection has been made that it is difficult to destroy the invading micro-organism without damaging the tissues and thus weakening or destroying the defensive mechanism, and, moreover, many infections are in organs so deeply seated that it is impossible to reach the micro-organisms by direct methods. For these reasons it becomes necessary to find other means, and researches in chemiotherapy and in the enhancement of immunity reactions have thus been stimulated. During the last decade the treatment of microbic infections by means directed towards enhancement of immunity or building up the body resistance has been given a very prominent place by the introduction of the method of vaccination of Sir Almroth Wright, and to such a degree has the vaccine treatment become the fashion that by many it has been looked upon as a panacea for every microbic infection and employed very often to the exclusion of other methods. Of recent years the defects and disappointments of phylactic vaccine-therapy have begun to be recognised and the value of chemio-therapy has been more favourably regarded. Of the value of chemical therapy the modern treatment of syphilis by organic compounds of arsenic is a striking example, as also are the older treatments by mercury and by iodides. The treatment of tuberculosis by iodine administered internally has also been lately revived, and a recent addition to chemiotherapy is the employment of compounds of tin in staphylococcal infections. Apart from its bearing upon the general therapeutics of microbic infections the treatment of staphylococcal infections of the skin is, and particularly at the present time, a subject of considerable interest and importance. Staphylococcal infections in the form of sycosis, chronic furunculosis, and of other chronic eruptions, are widely prevalent in invalided soldiers as sequelæ of impetigo contagiosa, of scabies, and of suppurating wounds, and every medical man who has had to do with these cases realises their obstinacy to treatment. It will be useful, therefore, to review more closely the different methods of combating microbic invasions as they concern these chronic staphylococcal infections of the skin.

First, as regards local applications, these remedies, to be effectual, must be introduced into the perifollicular abscess which constitutes the lesion of sycosis or of furunculosis, and there is one drug which is of especial value for this purpose—namely, pure carbolic acid, which serves to destroy the micro-organisms, while it acts as an analgesic. In the case of boils the pure carbolic acid is introduced through the pointing apex, first by means of a sharpened match stick and then on a small swab of wool round the points of a sinus forceps. The pus is then gently squeezed out and the whole cavity of the abscess very thoroughly swabbed with the carbolic acid through the apical opening. To be effective this must be done very thoroughly until all the softer tissue is destroyed. If the process is carried out very gradually the acid anæsthetises as it goes and very little pain is felt. The boil rapidly subsides and disappears in a few days. Every boil present and every fresh boil must be dealt with in the same way. In sycosis the small follicular abscesses must be individually punctured.

The method of treatment by enhancing the resistance includes, besides vaccine therapy, that of an outdoor life, the administration of yeast, and the application of hot fomentations. Hot fomentations are among the most valuable treatments for acute furunculosis, and they act probably by attracting antibodies to the inflamed area. To be efficient they should be hot, large, and frequently applied. An application every quarter of an hour for three hours is better than a three-hourly change in 24.

The treatment of staphylococcal infections by vaccines still holds a high place in the opinion of many, but though sometimes successful it very often fails, and sometimes the eruption is eventually made worse. The older yeast therapy, probably a form of vaccine-therapy, seldom, if ever, appears to do good.

We come now to the method of drug administration. Sulphide of calcium, which has for long been recommended in furunculosis, cannot be said to justify its reputation. It is interesting to note that organic compounds of arsenic administered intravenously have no effect on staphylococcal infections. But it is now maintained by Grégoire and Frouin that the chloride and oxide of tin administered by the mouth act as specifics in the treatment of staphylococcal infections. As shown by Captain Arthur Compton (see p. 99 of present issue), and in the short experience of others who have tried this new remedy, its results are so favourable that it promises to supersede all other forms of treatment of sycosis, furunculosis, and chronic staphylococcal eruptions. Although the results claimed for a new method must be received with reserve, this is certainly a treatment which demands further trial. A word should be said, too, for another modern method—namely, that of X rays. The best results are obtained in the more chronic staphylococcal infections, such as indolent boils and chronic pustular acne, in both of which complaints a cure may very often be effected by X ray applications. It is not easy to know in which category to place X ray applications. They act probably not by direct destruction of the micro-organisms, but possibly through liberation of antibodies by the breaking up of the chronic cellular inflammatory infiltration.

THE PART POTATO LOAF.

WE have received from the Ministry of Food a sample loaf of bread said to contain 10 per cent. of potato flour. We understand that every effort is being made by the Ministry of Food to assist bakers in the necessary operation of the inclusion of potatoes in the manufacture of bread. Machinery of quite simple character is being established for the production of potato flour, and though the output will not be available to any great extent for some time, there should be no delay in the utilisation of potato mash, which form is economical for the purpose and was generally practised some years ago. It is interesting to recall that the Bread Acts passed in the third year of George IV. and in the sixth and seventh of William IV. provided that

bread might be made of flour or meal of wheat, barley, rye, oats, buckwheat, Indian corn, peas, beans, rice, or potatoes, but it was unlawful to sell any bread made wholly or partially of peas or beans or potatoes, or of any sort of corn or other grain than wheat, unless such bread was marked with a large Roman M. No such marking was required, however, when in the making of wheat bread potato pulp was used. It has been known for a long time that the addition of potato to wheat flour improves the texture of the bread, principally because such addition is a stimulus to fermentation. Judging from the specimen loaf submitted to us by the Ministry of Food, there is nothing calling for adverse criticism in potato bread made by the addition of 10 per cent. of potato flour to Government Regulation flour. The texture of the loaf is satisfactory, its colour is good, its taste, with just a suspicion of sweetness, is acceptable, it masticates rather more easily than ordinary bread, and keeps moist, giving the impression of newness, for a longer time. Further, we have submitted it to analysis, and the results clearly show that this bread is in no way inferior to pre-war bread. The figures (percentages) are as follows, and side by side with them we give the analysis of a typical specimen of white bread and wholemeal bread:—

	G.R. bread with 10% potato flour.	Typical white bread.	Typical wholemeal bread.
Moisture	42·80	44·5	47·9
Carbohydrates (chiefly starch)	45·00	47·6	40·9
Protein (N × 6·3)	8·19	6·0	7·1
Mineral matter	1·00	0·7	1·4
Cellulose	1·50	0·3	1·5
Oily matter (ether extract) ...	1·51	0·9	1·2
Phosphoric acid (P_2O_5)	0·13	—	—

This is altogether a good nutritive loaf, and at a time when there is an abundance of potatoes available in the country the addition of potato flour should be welcomed, as it in no way detracts from the normal energy value of bread, while it effects a very important and considerable economy in the use of wheat flour. The widespread adoption of this bread can bring no hardship whatever, and the economy effected means the husbanding of our stock of cereals.

EYELASHES IN THE ANTERIOR CHAMBER.

IN the *Progrès Médical* Dr. A. Cantonnet has described a curious condition—the presence in the anterior chamber of a very rare form of foreign body, the rarest of the many kinds which have been observed there during the war.

A wounded man complains that he has suffered in the eyes ever since the explosion of a projectile. Examination of the cornea shows little losses of its epithelium, but there is no traumatic keratitis. If the eye be examined more closely, which is difficult because of the photophobia, there will be seen in the anterior chamber one or more fine and blackish objects which resemble eyelashes. Sometimes the lashes lie in the sagittal axis—that is to say, they run from the deep surface of the cornea, to which one end adheres, to the anterior surface of the iris or crystalline lens. In other cases the eyelashes lie flat on the iris, either at its periphery or near the pupil, through which they may pass so as to rest by one end on the anterior surface of the crystalline lens. Usually they number two or three, but as many as six have been observed. In some cases there is iritis with pericorneal injection, alteration of colour of the iris, myosis, and paresis of the pupillary reflexes. But more often the iris is not affected. There is always, however, acute irritation, which is shown by photophobia and blepharospasm. The diagnosis is easy if the eye be examined with a lens and oblique illumination; the eyelashes, whether they rest flat on the iris or traverse the anterior chamber, are unmistakable. They can be missed only if the surgeon contents himself with a superficial examination without oblique examination. The prognosis is not grave at first; serious iritis is rarely produced. But experience has shown that the eyelashes remain a long time in the eye and that the endothelium of the anterior surface of the iris proliferates, producing little bullæ (serous cysts of the iris). After some months or years these enlarge and end by filling more or less completely the anterior chamber, and disorganise the eye. The treatment consists in opening the anterior chamber at the nearest point to the eyelashes and removing them either with a fine forceps, such as is used in cataract extraction, or with a little blunt crotchet. This operation is easy when the eye is quiet and the lash runs from the cornea to the iris. It is difficult when the eye is inflamed and there is photophobia, or when the lash lies flat on the iris and has been there for some time. It may be difficult to seize the lash without the tissue of the iris at the same time. It may even be necessary to cut the iris, performing an actual iridectomy. If there are several eyelashes several operations may be necessary.

The pathogenesis of this condition is not easy to explain. It is difficult to understand how a body so supple, long, and light as an eyelash can be torn from the eyelid and driven through the cornea to the iris. If at the same time a lesion such as traumatic cataract is produced, indicating the entrance to the eye of a comparatively large body, it is easy to imagine that in its passage it may have detached an eyelash and carried this with it. But when there are only punctiform specks on the cornea, without proof of any penetration, it is difficult to understand how the lashes can have penetrated.

TETANUS IN CIVILIAN PRACTICE.

AT a recent inquest in a London area upon a motor-driver who was injured a week earlier in an air raid it was stated that the cause of death was tetanus, but nothing was reported in regard to the administration of antitoxin. In this particular case it may or may not have been given, but it is quite certain that in London, at all events, a certain number of cases of tetanus which end fatally have not received antitetanic serum. We have now some figures of the fatal cases of tetanus coming before certain London coroners. One of these officers sees 15 or 20 cases a year, all of them from hospitals or infirmaries where serum has been given too late, as the result has shown. The majority of the patients were gardeners in suburban districts, and it is open to doubt whether the wounds from which the tetanus infection originated were shown to a medical man or, if shown, were of a character suggesting the need for preventive serum. At any rate, no prophylactic dose of serum had been given. A second coroner, who frequently holds inquests on deaths from tetanus, tells us that in his experience the general practitioner does not administer antitetanic serum when symptoms of tetanus arise in cases under his care, but sends the patient to hospital, losing valuable time in so doing. An analysis of all the cases of tetanus coming before a third coroner of a London district during the last 15 years is also before us. Out of a total number of 38 cases, in 32 serum had been injected and in 6 it had not. The latter were of various ages, scattered nearly evenly over the first six decades of life, and had this in common, that they were treated in public institutions where, in the majority of cases at least, they came under observation when tetanus was fully developed. The omission, therefore, to give serum in the institution may have been due to a well-justified scepticism regarding its value when the tetano-toxin has already laid a firm hold on the nerve centres. But in all these cases there must have been a time between the infliction of the injury and the development of the first symptom of tetanus when the

injection of serum would have exerted a modifying influence on the disease. Of course, the injury may have been a trifling one—we are, of course, in doubt on the point; it may not have been seen by a medical man at all, or if seen there may have been nothing to indicate a possible infection with the tetanus bacillus or the desirability of preventing the effects of such an infection. The treatment of these six cases may, in fact, have been all that it should have been, and sheer bad luck determined the sad result. We should like, however, to suggest, in view of the irrefutable evidence from the battlefield of the prophylactic value of antitetanic serum, that any bruised and dirty wound contracted in civil life, especially those fouled with garden soil or street mud, should receive the same consideration. One London coroner advocates the holding of a supply of serum by the medical officer of health at the disposal of practitioners in his area. Doubtless in so doing much serum will be used for cases in which tetanus would not have developed, but even a small percentage risk of this terrible disease is not one to be lightly taken by the patient or by his medical attendant for him.

THE DIAGNOSIS OF NON-TUBERCULOUS PULMONARY DISEASE.

THE tendency to label any persistent subacute symptoms or signs in the lungs as tuberculous may be a healthy reaction from the minimising of such useful criteria, but has drawbacks of its own. In another column Colonel W. Pasteur and Major Bernard Hudson draw attention to a group of pulmonary signs which less acute clinical observers might have been content to call tuberculous or assign to the loose but convenient rubric of "pyrexia of unknown origin." The careful analysis in the trenches of various forms of pulmonary disease is a fruitful object for further research. Schlayer[1] has recently made a useful contribution from enemy experiences. He describes bronchial catarrh as presenting a very varying picture, the commonest kind being that which persists after an attack of one of the exanthemata; cold and chill, he rightly asserts, are much too frequently assigned as causes of this. The bronchitis of lymphatic subjects occurs but rarely in the field. The French *catarrhe sec* and the eosinophilic bronchitis found with neuroses, which is a rudimentary form of bronchial asthma, are often diagnosed as heart disease; investigation of the sputum, which shows eosinophile cells, and occasionally Curschmann's spirals and Charcot's crystals, settles the matter. Regular bronchial asthma and hysterical dyspnœa often co-exist. Characteristic bronchitis chronica muco-purulenta is rare. The contraction of scar tissue can cause bronchitis, and indeed bronchiectasis, which is frequently complicated with pulmonary tuberculosis, especially of the hilus. Non-tuberculous bronchiectatic subjects may sometimes be employed as clerks or as technical workers indoors. The Roentgen picture of pneumokoniosis, and, indeed, of the lungs of older men generally, may lead to confusion with hilus tuberculosis quite frequently. Pneumonias often take a long time to clear up. Gas poisoning is to be recognised by orthopnœa and extreme cyanosis; a high pulse-rate is bad prognostically; and the sequelæ are late pneumonia, pleurisy, and lung gangrene. Tumours and pulmonary syphilis are rare, and mostly mistaken for tubercle. Kyphoscoliosis often gives physical signs like tubercle, too. Primary emphysema is rare. Men wounded in the lung must be returned to field duty with caution, it being necessary to watch them for three months at least. Pleurisy, empyema, and lung hernia are likely sequelæ. Our summary of Schlayer's work is a brief one, but it may, at least, serve to indicate directions for further inquiry.

[1] Württ. medizin. Corr.-Blatt, 1917, Nr. 30.

IN our list of C.B.'s (Military Division) appointed for services rendered in connexion with the war the name of Lieutenant-Colonel G. Seaton Buchanan, assistant medical officer of the Local Government Board and inspector-general for sanitary purposes, was omitted. Colonel Buchanan, as a member of the Advisory Committee for the prevention of disease in the Mediterranean and Mesopotamian area, did work of the highest order in Egypt, Gallipoli, Salonika, and on the Tigris, and how well his distinction was merited may be gathered from a paper read last December at the Epidemiological Section of the Royal Society of Medicine.

THE BELGIAN DOCTORS' AND PHARMACISTS' RELIEF FUND.

A MEETING of the Executive Committee of this Fund was held on Monday, Jan. 14th, at the offices of THE LANCET, Sir Rickman Godlee presiding. Dr. Sprigge, the honorary secretary, reported that a letter signed by the Executive Committee and including the letter from Mr. W. B. Poland, Director for Europe of the Commission for Relief in Belgium, had appeared in the medical and pharmaceutical journals in the last week of December. He then read a letter which it was proposed to address to the General Committee of the Fund inviting them to attend a meeting to be held on Jan. 31st at the Royal Society of Medicine. The terms of the letter were discussed and finally adopted. Dr. Herbert Spencer raised the question of summoning the whole constituency of the Fund, and it was also suggested by him and other speakers that laymen might be invited to attend, but Dr. Alfred Cox thought that any such meeting should follow on the meeting of the General Committee.

Dr. H. A. Des Vœux, the honorary treasurer, and Dr. C. O. Hawthorne both pointed out the necessity of getting local committees to work. The question of obtaining further support from America was discussed, and Dr. Herbert Spencer mentioned that the American Gynecological Congress might give some opportunity for publicity to the movement in the States.

Dr. Des Vœux made a financial statement which showed that there remained in the Fund now a total of only £1096, while over a third of this sum had been received from the second appeal. The Committee felt that in those circumstances it would not be possible to send more than £400 to Belgium for the month of January, although they deeply regretted having in this manner to curtail the work which had been maintained without check for so long, and concerning whose great value to medical and pharmaceutical practitioners in Belgium they had received definite and pathetic proof.

SUBSCRIPTIONS.

The following subscriptions to the Fund have been received during the week ending Monday, Jan. 14th :—

	£	s.	d.
Dr. T. F. Keenan	1	0	0
Dr. N. J. McKie	1	1	0
Mr. Alfred Wright ...	0	5	0
Dr. A. Gordon Watson	1	1	0
Dr. Annie E. Clark ...	2	2	0
Capt. H. H. Taylor ...	5	0	0
Dr. W. J Dewar	2	2	0
Dr. F. T. McDonnell ...	1	1	0
Sir Clifford Allbutt ...	5	0	0
Dr. A. H. Peniston ...	1	1	0
Dr. H. Simmons	2	2	0
Sir Rickman J. Godlee	34	8	0
Dr. A. S. Hedley	1	1	0
Dr. Allan	1	1	0
Dr E. L. Bunting... ...	2	2	0
Dr. Percy Kidd	5	0	0
Dr. Dawson Williams ...	5	5	0
Dr. Elsie M. Chubb ...	2	2	0
Dr. J. Quinton Bown ...	2	2	0
A Friend	10	0	0
Dr. S. Squire Sprigge...	5	5	0

Subscriptions to the Fund should be sent to the treasurer of the Fund, Dr. H. A. Des Vœux, at 14, Buckingham Gate, London, S.W.1, and should be made payable to the Belgium Doctors' and Pharmacists' Relief Fund, crossed Lloyds Bank, Limited.

THE CONTROL OF VENEREAL DISEASES.

The Present Position in regard to Venereal Diseases.

AT the Chester meeting of the Royal Sanitary Institute on Jan. 11th, Dr. T. W. Naylor Barlow, M.O.H. for the county borough of Wallasey, read a paper entitled "The Present Position with regard to Venereal Diseases: Will the Methods now Available be Sufficient?" After some general remarks on the prevalence of these diseases, their profound effect on the public health, and the loss each year of many million pounds owing to the reduced wage-earning power of the individuals infected, while the indirect cost to the community of providing workhouses, asylums, and the like was even greater, Dr. Barlow went on to describe the schemes for diagnosis and treatment which are now actually in working order in many parts of the country. In regard to the vexed question of notification, Dr. Barlow thought that any system postulated the goodwill of the medical profession. Even now many doctors objected to notify cases of phthisis, and the objection would be greater in the case of venereal diseases. It was too early to judge of the success of the schemes now in force, but if it be found that the present facilities are not taken up by sufferers, Dr. Barlow considered some method of securing compulsory treatment, either at treatment centres or by patients' own doctors, should be instituted. Any person known to be responsible for transmitting venereal disease to another should be punished, prisoners in jails should be examined and, if found in an infectious state, detained until cured. Queensland, Western Australia, and Sweden had already taken drastic measures to stamp out venereal diseases, but before such measures could be taken in this country much propaganda work would have to be done. "Liberty of the subject in this country is a fetish," Dr. Barlow concluded, "but where the freedom of an individual involves danger to others, such person's liberty should be temporarily restrained, for the same reason that the liberty of a burglar is taken away because he breaks into other people's houses."

Antenatal Syphilis.

In his presidential address on Antenatal Syphilis, which we published in full last week, Dr. Amand Routh dealt with a number of problems concerning syphilitic infection of the fœtal membranes. Further investigation is greatly to be desired and the material may well be available in connexion with some of the larger centres for venereal treatment. Wards have been opened for pregnant women at the venereal centre, Thavies Inn (London, E.C.), since September last, and there is good reason to believe that much can be done for cases of syphilis, both as regards mother and child, if under treatment six weeks or two months before the confinement: a mother under such circumstances may have her Wassermann reaction changed from strongly positive to negative or slightly positive only, while that of the placenta and of blood from the child at the time of birth may be quite negative and the child continue to do well without further treatment. We hope that at this and other centres some of Dr. Routh's queries may receive definite answer.

Preventive Work among Women in Portsmouth.

The Portsmouth Church Council for Preventive and Rescue Work has opened a home with nine beds under the charge of a trained nurse for young women found to be suffering from venereal disease at the venereal treatment centre. The home is of a voluntary nature, is run on non-sectarian lines, and is made as cheerful and comfortable as possible; the girls are encouraged to make a stay of a year or more before going out to find employment. The expenses of management are borne as regards three-fifths by the Local Government Board, one-fifth by the Portsmouth corporation, and one-fifth by the Church Council.

Manchester's Grant for Educational Work.

The Local Government Board has refused to approve the grant of nearly £1000 by the Manchester City Council to the local branch of the National Council for Combating Venereal Diseases, being the whole of the annual expenditure incurred by the branch Council. The Hospitals Subcommittee of the City Council has accordingly proposed that the grant should be reduced to £500 and be subject to: (1) The approval of the Local Government Board and to their undertaking to repay 75 per cent. of such expenditure; and (2) to the contribution not being earmarked for any particular item of expenditure, but for use in active propaganda work in the city.

The Supply of Salvarsan.

The Local Government Board has approved of the salvarsan manufactured by Messrs. Evans, Sons, Lescher, and Webb, Limited, of 56, Hanover-street, Liverpool, as a substitute for the German preparation. Supplies of this drug can be obtained by local authorities and the authorities of hospitals approved by the Board under the Venereal Diseases Regulations at the following rates:—

	s.	d.		s.	d.
Dose of 0·1 gramme ...	1	0	Dose of 0·6 gramme ...	5	0
,, 0·2 ,, ...	2	0	,, 1·0 ,, ...	9	0
,, 0·3 ,, ...	3	0	,, 2·0 ,, ...	17	0
,, 0·4 ,, ...	4	0	,, 3·0 ,, ...	25	0
,, 0·5 ,, ...	4	6			

Orders for all salvarsan substitutes are to be addressed to the manufacturers of the drugs.

CANADA.

(FROM OUR OWN CORESPONDENT.)

Medicine and the Canadian Militia.

WITHIN the past two or three months certain adverse comment, derived here from a certain part of the medical profession in respect of the administration of military medical affairs, had to some extent quieted down, but the enactment of the Military Service Act and the conferences now being held between the Canadian Hospitals Commission and the Army Medical Service have brought all the questions involved into the limelight, as the President of the Academy of Medicine, Toronto, Dr. D. J. Gibb Wishart, in his presidential address, well showed. Two questions of very great importance to the whole community of Canada are before the profession: First, the number of Army surgeons the medical profession of Canada can safely supply; second, the exemption of the medical student. Sir Robert Falconer, President of the University of Toronto, estimates that there are at present 6000 undergraduates on active service, of whom at least 1000 are serving in the ranks, and he considers that medical students should be exempt from conscription and regarded as the doctors of the future. It is clear that the people at home must continue to be supplied with medical attendance, and it is equally clear that the supply must be kept up by the gradual admission to the ranks of the profession of newly graduated doctors. At several Canadian universities medical teaching has been carried on continuously for 19 months in order to secure a sufficient supply of young physicians for the Army services, but the Government has not contributed $1 to the expense, or signified by honours or a word of thanks their sense of the fact that the teachers in the medical schools have been truly working in the interests of the Allied armies. Hospitals have "carried on" with many of their staffs overseas, much unremunerated work for returned soldiers is being performed, and the burden appears to be falling upon the few rather than upon many. The medical profession, therefore, is looking to the authorities at Ottawa to mobilise the whole profession so that those suited by age and experience may undertake posts suited to their capacity. They consider that younger men should go overseas; that men engaged in teaching and giving their time and attention to clinics should not be detached for less responsible duties; and that the medical faculties of the Universities should be formed into a medical corps whose services could be available for the treatment of returned soldiers. It is considered that a strong committee of leaders in the Canadian profession should be summoned to advise with the Surgeon-General, a committee which should be nominated by the National Medical Association, provincial medical associations, and the University medical faculties. The profession in Canada makes three requests to the authorities at Ottawa: (1) a seat upon the Militia Council for the Surgeon-General; (2) the appointment of a permanent surgeon-general whom the profession can trust and support; and (3) the appointment of the committee, as suggested above, as an official advisory committee. The clash has heretofore been between the Hospitals Commission, who desire to control everything in connexion therewith, and the Army Medical Corps, who consider that the care of the returned soldier should come under their department of the service. It is understood that the

Hospitals Commission are prepared to hand over the medical and surgical treatment to the C.A.M.C., but expect to retain the administration, the same as obtains in all regularly organised hospitals in Canada. Difficulties, however, may be expected unless they are met by organisation. The Finance Commissioner of Toronto and the medical officer of health have made a recommendation that the boards of the several hospitals operating in that city combine, or be governed by a commission, with a general manager with good business ability. There is said to be lack of coördination in work, and that the duplication of expenditures is costing Toronto thousands of dollars annually. The General Hospital, owing to war conditions, has been falling behind at the rate of $4000 per month; and large grants have recently had to be made to all the hospitals in the city to meet deficits. Toronto contributes annually to the maintenance of all the hospitals an amount exceeding $900,000.

Venereal Diseases in Canada.

In the eighth annual report of the Commission on Conservation of Canada, Public Health Section, the attention of the Canadian authorities, the medical profession, and the public generally is called to the prevalence of venereal diseases in Canada. It is a presentation of facts and figures by members of the Faculty of Medicine of the University of Toronto and of the staff of the Toronto General Hospital. Since Oct. 6th, 1916, routine Wassermann tests have been done in the wards of the Toronto General Hospital, and out of 971 tests 125 have shown positive syphilis—between 12 and 13 per cent. Although statistics for other hospitals in Canada are not available, it may be justly presumed that somewhat similar results could be established which would then stamp the whole question as one of great national importance. Not much, if anything, has been done in any of the provinces of Canada towards regulating or controlling venereal diseases, excepting in the province of Ontario. In this province three centres have been established for diagnosis—namely, in connexion with the laboratories of the Provincial Board of Health at Toronto, Kingston, and London, which are provided with adequate facilities for the free diagnosis of syphilis and gonorrhœa. The Ontario Board of Health is of the opinion that treatment should be carried out by medical men and institutions, for the function of the Board is prevention rather than treatment. They have also applied to the Commissioner of Patents at Ottawa for a licence to carry on the preparation of a product to take the place of salvarsan in order that its price may be cheapened to the public. Further, the Ontario Board of Health has entered upon an extensive propaganda of education by means of exhibits and literature. The Committee on Public Health of the Conservation Commission of Canada is of the opinion that legislation should be enacted providing for: (1) Registration of cases without name and address; (2) public registration and isolation of recalcitrants; (3) free treatment for all who apply for it; (4) free bacteriological and blood tests; (5) supervision of mental defectives; (6) the administration of the plan by a Dominion body, through or in coöperation with provincial boards of health. It is understood that legislation along these lines will be submitted at the next session of the Legislature in the province of Ontario.

The National Sanitarium Association: Annual Reports.

The National Sanitarium Association now embraces the following institutions: Muskoka Free Hospital for Consumptives, Muskoka Cottage Sanatorium, Toronto Free Hospital for Consumptives, King Edward Sanatorium for Consumptives, Queen Mary Hospital for Consumptive Children, Gage Institute Free Dispensary, the Samaritan Club, the Weston Sanitarium Club. The two first are at Gravenhurst, Ontario, the next three near Toronto at Weston, the Gage Institute in Toronto. The work is provincial, but patients are not accepted from those localities where similar institutions are established. Those who can afford to pay are privileged to pay up to $8.75 per week; the cost per patient per week last year approximated $13. The institutions were established in Muskoka 21 years ago, and at Weston some eight years later. Since that time some 10,628 patients have been cared for, 6173 of whom have in no way contributed toward their own maintenance, and 1955 paying but a few dollars. The operating expenses increased in 1916–17 by $50,000, making the total amount $437,869.

The War.

THE CASUALTY LIST.

THE following names of medical officers appear among the casualties announced since our last issue:—

Died.

Capt. S. H. Morris, R.A.M.C., qualified at Edinburgh in 1899, and after holding appointments at the Seamen's Hospital, Greenwich, and at the Poplar Hospital, London, he proceeded to South Africa, where he was medical officer to the British South Africa Administration. Later he returned to England and practised at Frizington, Cumberland. He died at the London Hospital.

Capt. S. G. Scott, R.A.M.C., was educated at Oxford and at St. Thomas's Hospital, London, and qualified in 1902. He held an appointment in the Throat Department at St. Thomas's, and was for a time demonstrator in pathology at the University of Leeds. Later he took up work at the Physiological Laboratory at Oxford, where he was demonstrator of histology. He was the author of several contributions to medical literature. He died of pneumonia at a casualty clearing station.

Wounded.

Capt. H. B. German, R.A.M.C., attached R.F.A.
Capt. J. G. Hill, R.A.M.C.
Lieut. J. W. Lindsay, R.A.M.C., attached London Regiment.
Capt. H. D. Clementi-Smith, R.A.M.C.
Capt. F. B. Ryan, R.A.M.C., attached R.E.

Missing.

Capt. H. J. Davidson, M.C., R.A.M.C., attd. Royal Fusiliers.

Prisoners in German Hands.

Capt. C. F. Dillon-Kelly, R.A.M.C., attached East Surrey Regiment.
Lieut.-Col. H. C. D. Rankin, R.A.M.C.
Capt. E. L. F. Nash, R.A.M.C.

Previously reported Missing, now reported Prisoners in German Hands.

Capt. H. H. Fairfax, R.A.M.C., attached Royal Warwickshire Regiment.
Lieut. A. S. Garewal, I.M.S.
Lieut. T. F. Ryan, R.A.M.C.

CASUALTIES AMONG THE SONS OF MEDICAL MEN.

The following additional casualties among the sons of medical men are reported:—

Lieut. C. J. Postlethwaite, Suffolk Regiment, died of wounds, son of Dr. F. Postlethwaite, of Brentnor, Devon.
Capt. R. F. Greenhill, Lancs. Fusiliers, died of wounds, only son of the late Dr. E. F. Greenhill, of Bedminster, Bristol.

THE HONOURS LIST.

The Victoria Cross.

To another member of the medical profession has been awarded the highest of all military honours—the Victoria Cross. It is to be regretted that he should have fallen in the discharge of his noble duty.

Capt. John Fox Russell, M.C., late R.A.M.C., attached R. W. Fusiliers.

For most conspicuous bravery displayed in action until he was killed. Captain Russell repeatedly went out to attend the wounded under murderous fire from snipers and machine-guns, and, in many cases where no other means were at hand, carried them in himself, although almost exhausted. He showed the highest possible degree of valour.

The death of Capt. Russell was recorded in THE LANCET of Nov. 24th, 1917, p. 805, and the award of the M.C. in THE LANCET of August 25th, 1917, p. 332.

The names of the following should be added to the list of appointments to the *Order of the British Empire* given in THE LANCET of last week:—

Commanders (C.B.E.).

Lt.-Col. John Tweedy Lewtas, Commissioner for Medical Services, Ministry of National Service.
Dr. T. H. C. Stevenson, Superintendent of Statistics, General Register Office.

Members (M.B.E.).

Lt.-Col. Harry Hyndman Balfour, South African Hospital, Richmond Park, Surrey.
Lt.-Col. William Joseph Bentley, Assistant Director of Dental Services, Canadian Forces.

With reference to the awards announced in THE LANCET of Oct. 6th, 1917, pp. 549–560, the following are the statements of service for which the decorations were conferred (all are members of the R.A.M.C. unless otherwise stated):—

Bar to the Distinguished Service Order.

Major James Samuel Yeaman Rogers, D.S.O.

For conspicuous gallantry and devotion to duty. Throughout several days' operations he attended to the wounded in the open under continuous heavy fire. Though all his stretcher-bearers were casualties, with utter disregard of danger he bound up the wounded and superintended their removal. His gallantry was most marked.

Distinguished Service Order.

Capt. (acting Lieut.-Col.) John Darling Bowie.

For conspicuous gallantry and devotion to duty. He worked continuously for 36 hours under heavy shell fire, supervising the removal of the wounded from the front line, and by his energetic example and personal assistance all casualties were cleared within a short time after the operations were completed. His disregard of danger and untiring devotion to duty had a splendid effect upon his men.

Temp. Capt. David Lees.

For conspicuous gallantry and devotion to duty. He passed through an intense barrage in order to attend to the wounded who were lying exposed to heavy fire of every description. Single-handed and under heavy shelling he dressed the wounds of an officer, a sergeant, and a private, and carried each of them in turn to a place of comparative safety. To do this he had to pass through the enemy's barrage no less than four times, but with complete disregard for his personal safety he went forward a fifth time to attend to others, inspiring all ranks by his own splendid example of fearlessness and devotion.

Temp. Capt. Ivan Clarkson Maclean, M.C.

For conspicuous gallantry and devotion to duty in clearing the wounded. He took his stretcher-bearers well in advance of our forward positions and behaved with the most exemplary courage and devotion throughout, sparing no efforts to collect the wounded men. After his battalion was relieved he continued to work under the heaviest fire for another 24 hours, and was severely wounded on his way back after all the cases had been cleared. He set a splendid example of energy and contempt of danger.

Major (temp. Lieut.-Col.) Edwin Charles Montgomery-Smith.

For conspicuous gallantry and devotion to duty in the supervision of the arrangements for the evacuation of the wounded. By a systematic study of the ground, clever selection of aid and relay posts and routes, he evacuated a large number of casualties during the operations. He worked untiringly, regardless of his personal safety, visiting all the advanced aid-posts. His work was invaluable.

Temp. Capt. John Boyd Orr, M.C.

For conspicuous gallantry and devotion to duty. He worked unceasingly for 48 hours without an aid-post and under an almost continuous barrage, attending to the wounded of three units of his brigade. He found time to visit the front line twice and attended to numerous cases under machine-gun and shell fire, and, although twice buried and rendered unconscious for two or three hours, he remained at duty until his brigade was relieved, displaying devotion and personal courage which were worthy of the highest praise. His gallant conduct has been brought to notice on more than one occasion by officers commanding units to whose wounded he had attended.

Temp. Capt. Hubert Arnold Pallant, M.C.

For conspicuous gallantry and devotion to duty. Hearing that a number of men belonging to another battalion were on the enemy bank of a river and unable to cross it owing to the bridge being destroyed, and to their being apparently unable to swim, he hurried to the scene, swam the river fully clothed, and induced the men to enter the water and cross with the aid of a rope. The most exhausted one he personally conveyed across. During this time the enemy were continually shelling both the river and the banks. He set a splendid example of energy and devotion to duty.

Temp. Capt. Gwilym David Watkins.

For conspicuous gallantry and devotion to duty. When cries for help were heard coming from a tank which had been abandoned in an isolated position in the outpost line he went 200 yards through a heavy barrage and rescued a badly wounded man from the tank. He dressed his wounds and carried him under heavy fire towards safety, until, being completely exhausted, he was compelled to put the man in a shell hole and go for assistance. He returned with another officer and, still under heavy fire, brought the man to safety. Throughout six days he displayed the same indomitable courage and extraordinary devotion to duty, constantly going into the open tending the wounded day and night. He undoubtedly saved many lives.

Bar to the Military Cross.

Capt. William Barnsley Allen, V.C., M.C.

For conspicuous gallantry and devotion to duty. During an intense bombardment of a town with high-explosive and gas shells, he left the advanced dressing station to search for wounded men. Hearing that there were some in a remote part of the town, he proceeded there, collected them, and supervised their removal to the dressing station. On his return, hearing that a party under another officer had not come in, he was on the point of starting out again to look for them when they appeared. Although seriously gassed, he continued to perform his duties with the greatest devotion and gallantry, until eventually evacuated to the casualty clearing station.

Temp. Lieut. (Temp. Capt.) Lancelot Gerard Bourdillon, D.S.O., M.C.

For conspicuous gallantry and devotion to duty on numerous occasions. He worked continuously for many days, organising stretcher-bearers and forming relay posts. This work was carried out under very heavy artillery and machine-gun fire, during which he showed an absolute disregard of personal danger and set a splendid example to all the officers and men employed on stretcher work. It was largely due to his devotion that many lives were saved.

Temp. Capt. Robert Inkerman Harris, M.C.

For conspicuous gallantry and devotion to duty under exceptional circumstances. When his corps main dressing station was shelled on three separate occasions, whilst crowded with patients, he supervised and directed the collection and evacuation of the wounded to a place of safety. This was quickly done owing to his coolness, promptitude, and disregard of personal danger, which did away with all confusion and reduced the casualties to a minimum.

Temp. Capt. Wilfred McFarlane, M.C.

For conspicuous gallantry and devotion to duty. He carried on his work for five days under very heavy shell fire. His coolness under fire, his absolute disregard of danger, and his cheerfulness under all circumstances, set a fine example to all ranks, and contributed greatly to the successful evacuation of the wounded.

Capt. Hugh Roger Partridge, M.C.

For conspicuous gallantry and devotion to duty. During an intense bombardment of a town with high-explosive and gas shells he led search parties into different parts of the town collecting the wounded and placing them in a cellar, where he attended to them. Later, when the bombardment subsided he superintended their removal to the advanced dressing station. On his return to the dressing station he continued to perform his duties, although his eyes were so swollen by gas that he was obliged to keep them open with his fingers. He undoubtedly saved several lives by his splendid devotion and total disregard of personal danger. He was eventually evacuated to the casualty clearing station.

Capt. John Dover Proud, M.C.

For conspicuous gallantry and devotion to duty. He worked for five days in charge of bearers practically without rest, personally assisting to evacuate stretcher cases under the heaviest shell fire, thus setting an example of gallantry and devotion to duty under most arduous circumstances.

Military Cross.

Temp. Capt. George Min Adam.

For conspicuous gallantry and devotion to duty when in charge of an advanced dressing station. He carried on with his steady work of dressing and evacuating the wounded in the open under heavy shell fire until his dressing station had to be abandoned owing to its destruction. He then got his cases away safely under most trying conditions and resumed his work at another point, continuing until he was utterly exhausted. He set a splendid example of steadfast courage and devotion to duty.

Capt. Cuthbert Delavel Shafto Agassiz.

For conspicuous gallantry and devotion to duty. He worked continuously for 30 hours organising his stretcher-bearers and collecting wounded from an area which was being constantly and heavily shelled. On three distinct occasions he had to go through the hostile barrage in order to do this, and although working the whole time over marshy and waterlogged ground, he kept such control over his men by his personal example of courage and coolness under most dangerous conditions that the wounded were successfully and rapidly evacuated.

Capt. Arthur Cyril Bateman.

For conspicuous gallantry and devotion to duty in repeatedly going round the front line and attending to the wounded, who had been lying out in some cases for two days. Although continually exposed to hostile sniping and machine-gun fire, he displayed the utmost disregard of danger.

Temp. Capt. Stanley James Annear Beale.

For conspicuous gallantry and devotion to duty when working in an advanced dressing post. This post was destroyed by a shell which killed the other medical officer and an orderly. Although badly shaken, Captain Beale promptly formed another post and continued to dress the wounded until relieved 24 hours later. It was owing to his untiring energy and splendid devotion to duty that many lives were saved.

Capt. Kenneth Biggs.

For conspicuous gallantry and devotion to duty in leading and organising his stretcher-bearers under intense fire of every description, in such a manner that our wounded were rapidly evacuated. He worked unceasingly in the open for 24 hours, until he was severely wounded, by his admirable courage and determination saving many lives.

Temp. Capt. Geoffrey Andrew Bird.

For conspicuous gallantry and devotion to duty. A lorry containing ammunition was set on fire about 200 yards from his aid-post. Although the road outside was heavily shelled he set a splendid example in personally carrying the wounded from the vicinity of the lorry to his aid-post, making the journey under heavy shell fire and in imminent danger of a sudden explosion of the ammunition, which eventually took place.

Capt. Ribton Gore Blair.

For conspicuous gallantry and devotion to duty. When his battery was heavily shelled, and the detachment of one gun had been either killed or wounded, he immediately went to the emplacement and dressed the wounded under heavy fire. It was owing to his gallant and fearless conduct on this occasion that the lives of many men were saved.

Capt. Francis Dawson Blandy.

For conspicuous gallantry and devotion to duty. He worked continuously for 36 hours under heavy shell fire and adverse conditions of weather, not only collecting the wounded of his own brigade, but also those of another who were lying in an advanced position. To do this he collected all the bearer parties that he could find and personally led them to the spots under heavy shell fire. By his gallant conduct in going forward again and again, regardless of his personal safety, he undoubtedly saved many lives.

Temp. Capt. Clarence Albert Brisco.

For conspicuous gallantry and devotion to duty when in charge of bearer parties. After 24 hours' continuous work in attending to the wounded without sleep or rest he conducted stretcher parties over ground which was swept by shell and machine-gun fire and almost impassable on account of the mud. He showed a total disregard of his personal danger, both during the attack and for several days afterwards, and by his splendid devotion and gallantry encouraged his men under the worst imaginable conditions.

Temp. Capt. William Thomson Brown.

For conspicuous gallantry and devotion to duty. Having gone out with the advanced party of his battalion at 6 A.M., he remained with them until the last party returned at midnight, rendering continuous assistance to the men of his own unit, and also to many others wounded on the road. His personal gallantry and utter disregard of danger not only upheld the traditions of his own corps, but set a fine example to all ranks of the unit to which he is attached.

Temp. Capt. Wilfrid Thomas Chaning-Pearce.

For conspicuous gallantry and devotion to duty in attending to wounded men belonging to nine different battalions under heavy and continuous shell fire. His aid-post was the only one in the vicinity in such a forward position, and he worked continuously and without rest until all the wounded had been attended to, displaying splendid devotion to duty.

Temp. Capt. Victor Lindley Connolly.

For conspicuous gallantry and devotion to duty. He led his bearers again and again through barrages of shell fire to attend to the wounded, and it was owing to his splendid courage and personal example that his bearers were kept at work clearing the wounded from a heavily shelled area.

Capt. Thomas Frederick Corkill.

For conspicuous gallantry and devotion to duty when in charge of a forward bearer party. He worked continually for four days under heavy shell fire, evacuating the wounded and setting his men a magnificent example of courage and disregard of danger. He personally led parties beyond the advanced aid-post to collect the wounded, and his great zeal and energy enabled him to overcome very serious transport difficulties.

Temp. Capt. George Theodore Cregan.

For conspicuous gallantry and devotion to duty in attending to the wounded under heavy shell fire. A few days later, after he had completed his usual round, he volunteered to remain at an advanced dressing station which was short-handed, and worked continually for 19 hours, treating and evacuating over 700 cases. This gallant and devoted act was performed under continuous and heavy shell fire, during which the dressing station itself was hit. His personal example and disregard of danger has at all times been most marked.

Temp. Capt. Douglas St Clair Creighton.

For conspicuous gallantry and devotion to duty in going forward to most exposed positions to dress and attend wounded, showing a total disregard for his personal safety. After he had cleared a very large area in this manner, he established a first aid-post in a forward position, and from there gave great assistance to the wounded of two or three other regiments as well as his own. His gallant conduct and fearless devotion saved the lives of many wounded.

Temp. Capt. Eric Payten Dark.

For conspicuous gallantry and devotion to duty in leading his bearers. He displayed great gallantry and disregard of danger in moving about in the open under the heaviest shell fire, collecting and evacuating the wounded. He worked continuously without a rest for 36 hours, by his energy and determination contributing largely to the rapid clearing of the battlefield.

Temp. Capt. James Walker Darling.

For conspicuous gallantry and devotion to duty. Throughout a long and tiring day he showed the utmost contempt of danger, his organisation of aid-posts and stretcher-bearers was beyond all praise, and his tireless energy and devotion in looking after the wounded were the admiration of every officer and N.C.O. of the battalion, many of whom specially mentioned him to the C.O. on account of his gallantry.

Temp. Capt. Harold Benjamin Day.

For conspicuous gallantry and devotion to duty. He worked night and day for four days with magnificent fearlessness, tending the wounded not only of his own battalion, but also of all others in the vicinity. At one moment he led a party of stretcher-bearers across the open and brought back 14 wounded in daylight, in full view of the enemy. This, however, is only one instance of the many heroic acts which this gallant officer performed under heavy shell and machine-gun fire.

Capt. William Ernest FitzGerald.

For conspicuous gallantry and devotion to duty in attending to wounded and gassed men during a heavy gas shell bombardment. To do so he had to remove his mask, although he knew the risk, and was badly gassed in consequence. Although suffering badly from the gas he remained on duty until the following day, when he was ordered to the dressing station, having displayed magnificent pluck and devotion to duty.

Temp. Capt. Robert Stuart Gibson.

For conspicuous gallantry and devotion to duty during an intense hostile bombardment. He crossed the ground where very heavy shells were continuously bursting, and remained in a battery position attending the wounded under heavy fire and at great risk to himself. He displayed magnificent fearlessness and devotion to duty.

Temp. Capt. John Charles Boileau Grant.

For conspicuous gallantry and devotion to duty during an attack. Finding that all his stretcher-bearers were occupied, he went forward and dressed the cases himself on the spot, sending them back as opportunity arose and stretchers turned up. By this gallant act of devotion he undoubtedly expedited the evacuation of the wounded from the shelled area.

Temp. Capt. Norman Grellier.

For conspicuous gallantry and devotion to duty during an attack. A shell came through the door of his aid-post, killing his sergeant and several other men; he himself was knocked over and severely shaken by the concussion. In spite of this, however, he carried on his work unaided and remained at his post under continual hostile shell fire, setting a magnificent example of devotion and fearlessness.

Temp. Capt. Frederick Harris.

For conspicuous gallantry and devotion to duty in working for three hours in the open under an intense hostile bombardment, during which time he succeeded in getting many of the wounded under cover, and undoubtedly saved many lives. His coolness and fearless devotion were beyond all praise.

Temp. Lieut. Gerald Woodforde Harrison.

For conspicuous gallantry and devotion to duty during an attack. His aid-post being blown up, he worked in the open, dressing the wounded, moving freely about under heavy shell fire, and by his great personal exertions and complete disregard of danger, under very trying circumstances, he was instrumental in saving the lives of many men.

Temp. Capt. Howard Havelock Hepburn.

For conspicuous gallantry and devotion to duty in accompanying his brigade into a forward position, where he attended to the wounded under very heavy shell fire, and remained with the guns until they withdrew. By his coolness and courage he greatly inspired all the detachments, and carried out his work with utter disregard of personal safety throughout the day. But for his great gallantry, under most difficult conditions, many more lives would have been lost.

Temp. Capt. James Hill.

For conspicuous gallantry and devotion to duty in working unceasingly for 40 hours evacuating wounded and continually going over ground which was under heavy shell fire. He showed great zeal and splendid fearlessness in his work, by his personal example earning the admiration of all ranks.

Temp. Lieut. Reginald Gordon Hill.

For conspicuous gallantry and devotion to duty. During an attack he continually attended to wounded under a heavy barrage, and, on the objective being gained, he quickly formed a dressing station, where he was indefatigable in his attention to the wounded of his own and another battalion, although under continuous fire for two days. By his cheerfulness and splendid devotion to duty he set a fine example to all ranks.

Temp. Lieut. William Johnstone Isbister.

For conspicuous gallantry and devotion to duty. During the attack and capture of a position he displayed complete disregard of danger in attending to the wounded and evacuating them under heavy shell fire. During this work, all of which was done under great difficulty and practically in the open, he was once partly buried, but completed his dressing of the wounded, setting a splendid example of devotion to all.

Temp. Lieut. Ronald Sinclaire Kennedy.

For conspicuous gallantry and devotion to duty in dressing and attending to wounded men under extremely heavy shell fire. At great risk of his life he made several journeys to the front line and personally brought in wounded men who otherwise must have been killed by the intense hostile barrage.

Temp. Capt. Archibald Forbes Laird.

For conspicuous gallantry and devotion to duty. He established his aid-post in a farm and attended the wounded for three days, although under constant shell fire, which at times became intense. He was slightly wounded in three places, but his gallantry and devotion to duty were the cause of saving many casualties.

Temp. Capt. George Edwin Lindsay.

For conspicuous gallantry and devotion to duty. In addition to dressing over 600 cases at his aid-post, he made repeated journeys to the front line under heavy fire, seeking for and collecting wounded. He carried one wounded man off the field on his back through rifle, machine gun, and shell fire, and when he had finally got all our own wounded back he made another journey into the front line to try to rescue some of the wounded enemy in front of our lines. By his coolness, daring, and unselfish disregard of personal danger he saved many lives.

Temp. Capt. Clement Richard MacLeod.

For conspicuous gallantry and devotion to duty when in charge of an advanced dressing station. In the face of extreme hostile shelling he led stretcher-bearers, collecting the wounded and gassed cases, and throughout a period of 24 hours displaying a coolness and gallantry which directly influenced the saving of many lives.

Temp. Capt. Daniel McVicker.

For conspicuous gallantry and devotion to duty in attending to the wounded. He was three times wounded on the same day, but although in great pain he continued to carry on until completely exhausted and unable to go any further, when he was ordered back to the dressing station. His pluck and devotion to duty were beyond all praise.

Temp. Capt. Jerome Ivo O'Sullivan.

For conspicuous gallantry and devotion to duty when in charge of bearers. In conjunction with another officer he personally supervised the collection of many wounded in front of our lines and got them into dug outs in our front line. He then conducted his bearers himself round these dug-outs, continuing to do so until all the cases had been cleared. During the subsequent operations he repeatedly led his bearers through heavy barrages, inspiring them with such enthusiasm by his own personal courage that the evacuation of all the wounded was successfully carried out.

Temp. Capt. William Hilton Parry.

For conspicuous gallantry and devotion to duty when in command of a bearer division. He led his bearer squads through shell fire with great fearlessness and devotion in order to collect the wounded, and worked without a rest for 36 hours, dressing and evacuating wounded from the front line under the most trying conditions.

Temp. Capt. James Alexander Paterson.

For conspicuous gallantry and devotion to duty when the rear of his battalion was heavily shelled on the line of march. Under an intense hostile bombardment he hastened to the spot, dressed the wounded and cleared them from the road, personally seeing to their removal to the aid-post. He then returned and cleared the dead from the road, setting a fine example of coolness and disregard of danger.

Temp. Capt. Frederick Tavinor Rees.

For conspicuous gallantry and devotion to duty when in command of bearer divisions. He displayed tireless energy in making preparations for the attack, and during the operations carried out his duties with splendid devotion, frequently working under difficult and dangerous conditions. Early in the action he went forward under fire and made a thorough personal reconnaissance over difficult ground, thereby facilitating the clearance of the wounded.

Temp. Capt. Douglas Swan Robertson.

For conspicuous gallantry and devotion to duty. Although slightly gassed on the evening before an attack, he carried on throughout the whole of the following day and night, attending to the wounded in the open under heavy shell fire with a splendid disregard of personal danger, although nearly all his stretcher-bearers were killed or wounded around him. Two days later he helped to dig out a man who had been buried by a shell, working the whole time under heavy shell fire. He was slightly wounded, but remained with his battalion.

Capt. Gilbert William Rogers.

For conspicuous gallantry and devotion to duty in attending to the wounded under heavy shell fire. He personally supervised the evacuation of the wounded, and by his ability and utter disregard of his own personal safety was able to ensure the work being rapidly and successfully carried out. He set a splendid example to all ranks.

Capt. James Ellis Rusby.

For conspicuous gallantry and devotion to duty whilst acting as Bearer Officer during five days' heavy fighting. He led a party of stretcher-bearers through an intense artillery barrage, inspiring them and giving them courage by his own gallant and fearless example. Several of his men were wounded whilst passing through the barrage, and he stopped to dress them himself, although shells were falling all around. On many occasions he attended the wounded in the open, although exposed to very heavy shelling, very greatly inspiring his men by his personal coolness and disregard of danger.

Temp. Lieut. John Peter Ryan.

For conspicuous gallantry and devotion to duty. When heavy casualties were occurring in the batteries he showed complete disregard of danger in going out into the open for the wounded, rescuing those who were buried and dressing the wounded. During the whole time heavy shells were falling close by, and on two occasions he was knocked down by these and by exploding ammunition dumps.

Temp. Capt. Alexander Hugh Dickson Smith.

For conspicuous gallantry and devotion to duty. During a heavy hostile bombardment of a battery position a gunner was severely wounded and buried by a shell. Captain Smith came over from the next battery position, and with the assistance of a gunner helped to extricate the wounded man and dress him where he lay. The enemy's fire continued throughout, one shell falling a few yards away and wounding the gunner. In spite of this, however, the dressing was completed and the wounded man safely removed.

Temp. Capt. James Anstruther Smith.

For conspicuous gallantry and devotion to duty. During an advance he worked with unflinching energy, collecting and dressing wounded under heavy fire in the open. By his great personal courage and devotion to duty he cheered all ranks and undoubtedly saved many lives.

Capt. Herbert Mather Spoor.

For conspicuous gallantry and devotion to duty. Under an intense hostile bombardment he dashed out of a cellar where he was sheltering, and ran across the open to attend to two men who had been wounded in a dug-out. After attending to them he noticed that the house he had just left was hit, whereupon he ran back again through heavy shell fire to see if his services were required. He displayed splendid gallantry and total disregard of his personal safety.

Capt. Robert Alexander Stark.

For conspicuous gallantry and devotion to duty when in charge of an advanced dressing station under an intense bombardment. He worked steadily for over 12 hours, and, although seriously affected by gas, did not complain, until he finally collapsed from the effects, and was found lying on the ground. He personally supervised the clearing of a thousand cases, and it was largely due to his splendid self-sacrifice and devotion that the complete and successful evacuation of the casualties was effected.

Capt. John Stephenson.

For conspicuous gallantry and devotion to duty when in charge of stretcher-bearers. He remained in charge of his sector for 13 days, refusing to be relieved, although his bearers had to be reinforced and the aid-post had to constantly change position owing to heavy shell fire. His personal example and gallant leadership were largely responsible for the way in which his bearers stuck to their duty.

Capt. William Howard Edwin Stewart.

For conspicuous gallantry and devotion to duty when in charge of a loading-post for ambulance cars. His work entailed his being on a road whenever shelling took place there, in order to accelerate the removal of the wounded from that point and to arrange all possible protection for such wounded as could not be cleared. He personally went to the assistance of four men who had been wounded by a shell and dressed them in the open under heavy fire, setting an admirable example of coolness and devotion to duty under difficult and trying circumstances.

Temp. Capt. Thomas James Logan Thompson, attached K.O.S.B.

For conspicuous gallantry and devotion to duty. He established an aid-post, where he worked continually at the evacuation of the wounded, although under heavy shell fire and in the open for most of the day. He was very cool and wonderfully cheerful during the whole time especially under particularly heavy shell fire during the night, by his splendid example inspiring the wounded with the greatest confidence.

Temp. Capt. Edward Archibald Walker.

For conspicuous gallantry and devotion to duty in continually leading his stretcher-bearers through heavy barrage and successfully bringing back wounded under heavy shell fire.

Temp. Lieut. Thomas Charles Dalrymple Watt.

For conspicuous gallantry and devotion to duty under exceptionally difficult and trying circumstances. Owing to continual rain and heavy shelling no trenches were available, and the men had to be distributed amongst shell holes, the regimental aid-post being in the open. He attended to the wounded unceasingly all day under continuous shell fire, repeatedly going through heavy fire to administer first aid. Owing to the mud many of the men would undoubtedly have been drowned but for his prompt assistance, and it was due to his splendid organisation and devotion to duty that all the wounded were evacuated by the evening.

Temp. Capt. Hubert Francis Wilson.

For conspicuous gallantry and devotion to duty. He repeatedly led stretcher-bearers under heavy fire, and succeeded in evacuating all the wounded on his front; and when most of the stretcher-bearers had become casualties he organised a party of riflemen, with whom he worked for eight hours in the open under shell fire, and continued to clear many wounded. He then returned and led up another large party, with which he succeeded in clearing the front, having displayed splendid courage and devotion to duty throughout the day.

Capt. John Canute Gordon Glassford, Australian A.M.C.

For conspicuous gallantry and devotion to duty when in charge of an advanced dressing station. He continued to work calmly for several hours under violent and accurate hostile fire, during which his dug-out was three times hit and considerably damaged. Throughout the operations he displayed a magnificent example of gallantry and devotion to duty and inspired all under him with a like disregard of personal risk. Much of his work was done in the open and under very trying and dangerous conditions, but the cheerfulness and imperturbability which he maintained in the face of danger were of the greatest assistance in the speedy evacuation of the wounded.

Capt. Herbert Myer Goldstein, New Zealand M.C.

For conspicuous gallantry and devotion to duty in establishing a forward aid-post in our advanced lines over a mile in front of his regimental aid-post. By his courageous decision to remain there in spite of heavy shelling, and his great gallantry and devotion in attending to the wounded, all the casualties were evacuated before the battalion was relieved.

MENTIONED IN DESPATCHES.

The names of the following medical officers are mentioned in a despatch, dated June 28th, 1917, received from General Sir Archibald Murray, K.C.B., at that time Commander-in-Chief of the Egyptian Expeditionary Force:—

Staff, &c.

Col. H. T. Knaggs, C.M.G., A.M.S.; Lt.-Col. (temp. Col.) A. E. C. Keble, D.S.O., R.A.M.C.; Col. R. H. Luce, C.B., V.D. (T.F. Res.); Col. C. J. MacDonald, A.M.S.; Temp. Lt.-Col. L. P. Phillips; Col. Sir J. Rogers, A.M.S.; Capt. J. H. Wood, M.C., R.A.M.C.

Royal Army Medical Corps.

Temp. Capt. R. R. Archibald; Capt. H. J. L. Barefoot; Capt. D. W. Berry Temp. Capt. J. T. Blea-dell; Temp. Capt. O. Bruce; Maj. (temp. Lt.-Col.) R. J. Cahill; Temp. Capt. W. T. Collier; Temp. Capt. H. Coppock; Temp. Capt. H. S. de Boer; Temp. Capt. N. Duggan; Capt. E. D. Gairdner, D.S.O.; Capt. W. Goldie; Capt. (temp. Maj.) W. W. Greer; Temp. Capt. J. W. C. Gunn; Capt. H. F. G. Hall; Capt. E. B. Hinde; Temp. Capt. D. L. Hutton; Temp. Capt. J. M. Johnston; Temp. Capt. C. Lodoges; Capt. N. Macinnes; Capt. D. J. Marr; Capt. J. M. Mitchell; Capt. P. J. Moir; Maj. (temp. Lt.-Col.) A. W. Moore; Capt. C. W. C. Myles; Lt.-Col. E. S. Powell; Capt. A. Rankine; Capt. C. F. Searle; Capt. A. B. Sloan; Temp. Lt. C. Speers; Temp. Lt. F. J. Waldmeier; Maj. (temp. Lt.-Col.) C. R. White; Temp. Capt. G. Wight.

Australian Army Medical Corps.—Maj (temp. Lt.-Col.) M. W. Cave; Col. R. M. Downes; Maj. W. Evans; Maj. W. R. C. Mainwaring; Maj. E. K. Parry; Lt.-Col. A. H. Thwaites.

New Zealand Medical Corps.—Lt.-Col. C. T. H. Newton.

FOREIGN DECORATIONS.

Russian.

Order of St. Anne.—Second Class (with Swords): Lt.-Col. (acting Col.) H. Hewetson, D.S.O., R.A.M.C. *Third Class:* Temp. Capt. A. H. Spicer, R.A.M.C.

Order of St. Stanislas.—First Class: Surg.-Gen. J. D. Edge, C.B. *Second Class:* Lt.-Col. W. W. O. Beveridge, C.B., D.S.O., R.A.M.C.; Temp. Maj. L. E. Owen, R.A.M.C. *Third Class (with Swords):* Lt. (temp. Capt.) T. J. Kelly, M.C., R.A.M.C.; Hon. Capt. J. H. Diamond, Canadian A.M.C.; Capt. C. A. Yates, Canadian A.M.C.

THE MEDICAL SERVICES IN MESOPOTAMIA AND ON THE WESTERN FRONT.

In despatches recently received the following references to the medical services occur:—

From the late Lieutenant-General Sir Stanley Maude, K.C.B., Commander-in-Chief, Mesopotamia Expeditionary Force.

The health of the troops during the summer months has been uniformly satisfactory, and many of the diseases from which we suffered in previous years—such as cholera, enteric fever, and scurvy—were either non-existent or negligible in their extent. This successful result was partly attributable to the untiring work of the officers employed in the bacteriological laboratories, without whose valuable assistance the difficulty of dealing with the epidemic diseases would have been considerably increased. But, although better conditions as regards accommodation and increased facilities for combating the heat resulted generally in a far lower sick-rate, an abnormal heat wave which swept over the area in July was responsible for a heavy casualty list. During this time the personnel of the Medical Services were severely taxed, but they resolutely and successfully responded to the calls made upon them. All ranks redoubled their exertions as the situation became more difficult, and the unremitting labours of the nursing sisters, many of whom suffered in health themselves, were worthy of the high record for devotion to duty which the Nursing Service has always maintained. The very practical assistance rendered by the British Red Cross Society and Order of St. John during this trying period was typical of the valuable services so consistently rendered by that organisation.

From Field-Marshal Sir Douglas Haig, K.T., G.C.B., G.C.V.O., Commander-in-Chief, British Armies in France.

The work of the Medical Service in all its branches has continued to afford me most valuable assistance. The high standard of efficiency displayed by all ranks of the Medical Service has resulted in an almost entire freedom from epidemic disease, and has been the cause of much saving of life and limb amongst the wounded.

The devotion and gallantry of the Royal Army Medical Corps and of the Medical Corps of the Overseas Dominions during the recent operations have earned universal admiration and praise. Their work of collecting the wounded from the front has been of an exceptionally arduous nature owing to the condition of the ground and weather. I regret that so many gallant officers and men have lost their lives in carrying out their duties.

The Medical Service of the United States of America has shared in the work of the British Medical Service, and has given very valuable help.

I am much indebted to the devotion and work of the consulting surgeons and physicians, and to the Auxiliary Services of the British Red Cross Society and Order of St. John of Jerusalem.

The Nursing Services, several of whose members have, unfortunately, lost their lives from hostile air raids, have, as always, devoted themselves with untiring care and zeal to their work of mercy.

The excellent organisation and administrative work of the Medical Services as a whole have given me entire satisfaction.

MINISTRY OF NATIONAL SERVICE: ITS MEDICAL ORGANISATION.

The first duty of the medical department of the Ministry of National Service was to take over the arrangements for the medical examination of recruits and to establish the recruiting boards on a civilian basis, and now that this has been carried out it may be well briefly to summarise the principles observed. The Ministry has made use throughout of the central and peripheral machinery already existing in the Central Professional Committees and the Local Medical War Committees throughout the country, which have given invaluable assistance to the Ministry. In each area the Local Medical War Committees were asked to suggest the names of practitioners able to give part-time services upon the medical boards, the idea being to spread the work as far as possible over a number of practitioners. It was recognised that this would lead to a greater economy in the use of medical man-power. The actual appointments to the panels, from which, from day to day, the boards were to be constituted, has remained in the hands of the Ministry, along with discretionary powers as to altering or adding to the lists of names suggested by local committees.

Medical Man power and Service on Medical Boards.

In practically every area boards are now working on the new basis, each under the chairmanship of a Deputy Commissioner of Medical Services, who is a whole-time officer appointed directly by the Ministry. At the request of the Ministry of Pensions arrangements are now being completed for the establishment of boards at discharge centres to examine the soldier upon discharge and estimate his pension, if any, as well as of pensions boards for the periodical re-examination of pensioners. For the personnel of these boards suggestions will be made by the Local Medical War Committees, the National Service Ministry reserving the right of actual appointment.

The establishment of these various medical boards has necessitated a wide survey of the medical man-power in the country in order that the work might be distributed so as to secure, in the first place, the right man for each form of work, and, in the second place, that each medical practitioner should take as far as possible his proper share of it. On this account a general survey of the medical man-power of the country became necessary, and medical men of military age were recently asked to submit themselves for medical examination. In the case of busy practitioners this may have entailed some hardship, but the request was dictated by considerations of national policy and will, doubtless, find a loyal response. The Deputy Commissioners of the Ministry in the different areas are working in close coöperation with the Local Medical War Committees and with other medical organisations, and are responsible for supplying the Ministry with all information as to the employment of medical men in their areas.

Routine of Medical Board Examinations.

The method of examination recommended by the Ministry of National Service to the medical boards under its direction is the sectional method—i.e., one in which all recruits will be seen at some stage of their examination by each member of the board, a member being in doubt upon any point in his own examination consulting with one or more of his colleagues. When the board consists of four examiners and the chairman, a method such as the following is suggested:—

Examiner No. 1 takes the weight, height, and chest measurement, notes the colour of the hair and eyes, complexion, external marks such as scars, vaccination marks, tattooing, and any indication of venereal disease.

Examiner No. 2 pays attention to the physical development, tests the movement of the joints, investigates deformities—e.g., knock-knee, flat-foot, hammer-toes, &c., and inquires into the history of injuries and operations, if any.

Examiner No. 3 tests the vision and hearing, and examines the eyes, ears, teeth, throat, and knee-jerks.

Examiner No. 4 examines the chest and abdomen, makes inquiries regarding previous illnesses such as rheumatic fever, tuberculosis, &c., and the mental condition, and any circumstances bearing on this, such as a history of fits, or of having been under treatment in an asylum for the insane. The urine, if necessary, will be tested at this stage. All specimens of urine examined for any purpose should be passed in the presence of the examiner.

Determination of the Grading.

In determining the grade in which the recruit is to be placed the board will always consider any documents bearing on his case that a man may bring. Each examiner in turn initials the medical history sheet of the recruit, entering the grade for which he considers the man fit, so far as his part of the examination is concerned. The chairman then enters the final grading, but if he finds that he cannot agree with the opinion of one or more of the examiners, he consults with the full board, adopting the opinion of the majority in instances where there is not unanimity. When opinions are equally divided, the chairman has the casting vote. If a case presents difficulties about which the board requires the opinion of someone specially versed in a particular department of medicine or surgery, the chairman will inform the regional commissioner, who will make arrangements accordingly.

Conduct of the Examination Itself.

The man enters the examination-room wearing a coat and slippers, which can readily be removed when desired. During the measurement of his chest, he stands erect with feet together and arms raised above the head. The tape is then so adjusted that its upper border touches the lower angles of the scapulæ behind, and its lower border the nipples in front. The arms are then dropped to the sides, and the girth noted after both extreme expiration and inspiration. Although no minimum of height, weight, or chest measurement is fixed, yet men whose height is below five feet, or weight less than 100 lb., or chest measurement less than 32 inches, must be carefully scrutinised to make sure that these low standards are not due to pathological conditions. Scrotum, testes, and abdominal rings are examined

either before or after the movements. In inspecting the physical development and movements the man stands about six feet away from the examiner, who suggests what movements he desires by going through them himself. The suggested test movements are as follows:—

For the upper extremities the following directions may be given: Extend the arms forwards with the palms upwards. Open and close the hand. Turn the backs of the hands upwards. Bend the wrists and elbows. Swing the arms round at the shoulders. For the lower extremities. Stand on one foot, first on the sole, then on the ball of the foot, then on the toes. If there is flat-foot, observe whether the arch reappears when standing on the toes. Note any defective movement of the metatarso-phalangeal joint of the great toe, also any deformities of the toes. When this exercise has been done with each foot, let the man stand on one foot, putting the other forward and moving the toe and ankle joints freely, repeating this with the other foot. He then kneels on one knee (there should be a mat or pad for this), then rises, kneels on the other knee, rises, then kneeling on both knees rises with a spring and leaps. He then swings each leg from the hips.

The recruit finally turns his back to the examiner and touches the ground with his hands, thus giving the examiner an opportunity for passing a hand along the spines of the vertebræ, then separates his legs for inspection of the perineum, for piles or fistula. The reaction of the pupils and the knee-jerks is tested in every recruit, and all cases of tabes or general paralysis should be rejected, however early the disease may be.

The Assessment of General Condition and Physique.

Direction is given that the general condition and physique must be considered for every grade. Often the man's occupation, such as that of blacksmith, navvy or miner, or the exercise he takes, such as football, cycling, walking, or the distance he covers by walking or cycling in a day's work, will show that he will be able to do the physical work of Grades 1 or 2. Sometimes the examiners will have no such guides, and then they may be doubtful as to the man's capability for physical exertion. Under these circumstances attention is directed to the response to such exertion as can be performed in the presence of the board. The most suitable form is hopping, carried out in the following manner:—

1. The man's pulse-rate is taken while he stands at rest.
2. He hops 20 times with the right and then 20 times with the left leg, always lifting the foot about 9 inches from the ground, without a pause.
3. Immediately after this the movements of the chest and of the alæ nasi should be observed while the man's attention is distracted by conversation. In health there should be no noteworthy breathlessness and no pallor nor anxiety of expression.
4. The rate of the pulse is taken two minutes after the exercise, and while the man still stands. In health it should not be more than five beats more than it was before the exercise.

The examiner of the heart and lungs, when the case requires it, puts the recruit through this hopping exercise. A minimum of mental capacity is assumed for all grades. Those failing to attain this minimum should be considered as unfit, for their usefulness to the State will be so limited as to make it unnecessary or uneconomical to call upon them for service. In doubtful cases inquiry should be made as to the standard they attained on leaving school and their wage-earning capacity.

Effect on Grading of the Common Disabilities.

For the assistance of medical boards an epitome has been drawn up indicating the usual effect upon gradation of the common disabilities and diseases found in the recruit. Each case is to be decided upon its own merits, but the statement is designed to ensure a reasonable uniformity in the grading of men throughout the country. We quote the statement in regard to the three important matters of sight, hearing, and heart condition:—

Minimum Standard of Vision.—Grade 1: With one eye, either right or left, 6/24 without glasses. R.E. 6/12, with glass if necessary. L.E. may be less than 6/60, but the eye must not be totally blind or missing. Both eyes must have good fields of vision as tested by hand movements. Strength of glasses not to exceed: Spherical, 8 D; cylindrical, 4 D; sph.-cyl., 8 D in highest meridian.

Grade 2: With one eye, either right or left, 6/60 without glasses. R.E. 6/18, with glass if necessary. L.E. may be less than 6/60, but the eye must not be totally blind or missing. Both eyes must have good fields of vision as tested by hand movements. Strength of glasses not to exceed: Spherical, 10 D; cylindrical, 6 D; sph.-cyl. 10 D in highest meridian.

Grade 3: Either R.E. 6/60, with or without glasses, and L.E. less or nil. Or R.E. less than 6/60 or nil, and L.E. 6/60, with or without glasses. The better eye must have a full field of vision as tested by hand movements. Strength of glasses not to exceed: Spherical, 15 D; cylindrical, 6 D; sph.-cyl., 15 D in highest meridian.

In all grades the eyes must be free from progressive or recurrent disease.

Deafness.—If the man can hear a soft, not forced whisper at a distance of 6 feet, with each ear, the other being closed, he is fit for Grades 1 and 2. If he cannot hear, care must be taken that the failure is not due to the presence of cerumen (wax). A man who cannot hear the spoken voice at a distance of more that one foot in one or other ear when he is not looking at the examiner should be placed in Grade 4. Those failing between these two classes should be placed in Grade 3. It is to be remembered that in some cases the man may be suffering from a cause producing loss of hearing which is merely of a transitory character—e.g., Eustachian and middle-ear catarrh following a cold. He may then be classified in Grade 1 or 2, as if the diminution of hearing did not exist. A man with complete unilateral deafness is usually without the sense of the direction from which sounds proceed, and it is then advisable to place him in Grade 3. The presence of an old perforation with a dry ear is of no importance, and the case must be judged solely on the degree of deafness. In cases of previous simple mastoid operation (Schwartze's) or radical mastoid operation, if the result is satisfactory, the amount of hearing will determine the grade, for these operations in themselves do not disqualify for any grade.

Diseases of the heart.—In all cases the heart should be examined with the man in both erect and lying positions. A systolic murmur is not necessarily an indication of disease of the heart. Most systolic murmurs heard only at the base of heart and systolic murmurs wherever located which disappear during full sustained inspiration do not indicate cardiac disease. If a systolic murmur definitely indicative of mitral regurgitation is present the man should not be classified in Grade 1. A man with a well-compensated mitral regurgitant murmur who shows healthy response to the exercise test already given may be placed in Grade 2 unless he has recently had a well-certified attack of rheumatic fever. A man with a mitral regurgitant murmur and showing but slight enlargement of the heart and no signs of failing compensation—e.g., œdema of the feet, dyspnœa on slight exertion, and who is able to follow his civil employment, may be placed in Grade 3 for light or sedentary work. Cases of mitral stenosis are, under the most favourable circumstances, fit only for sedentary work. No man suffering from aortic regurgitation is fit for Grades 1, 2, or 3. A systolic murmur at the base does not necessarily indicate aortic stenosis. Aortic stenosis apart from regurgitation is rare, and cases in which it is suspected should be referred for special examination. Enlargement of the heart is always pathological. Examination to determine the size of the heart should always be made with the man lying down. A diffuse impulse is not to be taken as a reliable sign of enlargement of the heart.

Irregularity of the heart is not necessarily evidence of disease. Variations in the pulse-rate with respiration and dropped beats are common irregularities and of no special pathological significance. They disappear when the rate of the heart is raised by exertion; irregularities indicating disease do not. If it is suspected that a man has taken drugs with a view to altering the action of the heart he should be referred for observation. A pulse-rate up to 120 per minute is often, especially in youths, merely due to the excitement of examination, and in the absence of evidence of diseases producing a rapid pulse it may be disregarded. Paroxysmal tachycardia is very rare. If this condition is suspected the man should be referred for special examination.

In addition to the other rejections mentioned in the statement, men suffering from the following conditions are to be placed without question in Grade 4: (1) Tuberculous peritonitis; (2) tuberculous laryngitis; (3) tuberculous cystitis or pyelitis; (4) cirrhosis of the liver; (5) ascites; (6) malignant disease anywhere; (7) nephritis, acute or chronic; (8) pernicious anæmia and all forms of leukæmia; (9) aneurysm; (10) tabes, general paralysis, and all organic diseases of the central nervous system; (11) sexual abnormalities, such as arrested development or hermaphroditism.

URBAN VITAL STATISTICS.

(Week ended Jan. 12th, 1918.)

English and Welsh Towns.—In the 96 English and Welsh towns, with an aggregate civil population estimated at nearly 17,000,000 persons, the annual rate of mortality further rose to 19·6, against rates steadily increasing from 11·9 to 18·0 per 1000 in the six preceding weeks. In London, with a population exceeding 4,000,000 persons, the death-rate was 22·2, or 0·9 per 1000 above that recorded in the previous week; among the remaining towns the rates ranged from 9·8 in Bury, 10·1 in Edmonton, and 10·3 in Smethwick to 26·4 in Tynemouth, 27·1 in Exeter, and 28·2 in Hastings. The principal epidemic diseases caused 451 deaths, which corresponded to an annual rate of 1·4 per 1000, and included 159 from measles, 144 from whooping-cough, 66 from diphtheria, 59 from infantile diarrhœa, 17 from scarlet fever, and 6 from enteric fever. Measles caused a death-rate of 2·0 in Cardiff, 2·2 in Leicester, 2·3 in Norwich, 2·8 in Merthyr Tydfil, 3·2 in Halifax, and 4·1 in Aberdare; whooping-cough of 2·5 in Wigan and 3·6 in Stockton-on-Tees; and diphtheria of 2·9 in St. Helens. The 1198 cases of scarlet fever and 1650 of diphtheria under treatment in the Metropolitan Asylums Hospitals and the London Fever Hospital were 29 and 20 below the respective numbers remaining at the end of the preceding week. Of the deaths from all causes in the 96 towns 217 resulted from violence. The causes of 47 deaths were uncertified, of which 13 were registered in Birmingham, 9 in Liverpool, and 3 in London.

Scotch Towns.—In the 16 largest Scotch towns, with an aggregate population estimated at nearly 2,500,000 persons, the annual rate of mortality was 16·0 per 1000, and coincided with that recorded in the previous week. The 396 deaths in Glasgow corresponded to an annual rate of 14·3 per 1000, and included 7 from whooping-cough, 6 from diphtheria, 3 from measles, and 2 from infantile diarrhœa. The 110 deaths in Edinburgh were equal to a rate of 17·2 per 1000, and included 4 from diphtheria, 3 from infantile diarrhœa, and 1 from measles.

Irish Towns.—The 169 deaths in Dublin corresponded to an annual rate of 22·1, or 3·8 per 1000 above that recorded in the previous week, and included 4 each from measles and infantile diarrhœa, 2 from whooping-cough, and 1 from enteric fever. The 151 deaths in Belfast were equal to a rate of 20·0 per 1000, and included 5 from whooping-cough, 4 each from measles and infantile diarrhœa, and 2 from diphtheria.

Correspondence.

"Audi alteram partem."

THE TREATMENT OF WOUNDS INVOLVING THE MUCOUS MEMBRANE OF THE MOUTH AND NOSE.

To the Editor of THE LANCET.

SIR,—May I through your columns be allowed to comment on Mr. Percival Cole's very interesting article in your issue of Jan. 5th? My criticism is based on more than 1500 cases seen during the past 18 months. Mr. Cole's disapproval of primary suture is doubtless founded on his experience, but that experience is presumably limited to cases first seen after the varying but inevitable delay which must occur before the patient reaches his care. His objection to primary suture is justified in a large proportion of cases, especially those not seen for two days or more after being wounded; but by no means does it always hold good for cases seen very early. So that what Mr. Cole tells us is, I think, only a part of the truth.

Like others who are engaged in this speciality in France, I finish some of my cases unto the last refinement of plastic work. Other patients we who work overseas are obliged to send home for lack of beds, especially during a rush. In this latter event we act as a filter; and in this filtering capacity we save the surgeons at home a great deal of responsibility by dealing with various desperate emergencies which they seldom if ever encounter. I constantly feel the truth of this when confronted with hæmorrhages, glottic œdema, and mediastinal abscesses. In other words, our experience covers the whole of the field familiar to those at home, as well as some ground which is to them almost, if not quite, unknown. And in this same category of problems which we must face but the surgeon in England escapes must be placed the question of suturing very recent wounds involving the mucosa of the mouth and nose. Now there occur massive wounds of the face where the soft tissues gape widely in enormous flaps. If these injuries be left alone, these flaps may be seen to shrink with a great loss of tissue. In such cases it is highly expedient, indeed imperative, to perform primary suture simply to give a better blood-supply to large pieces of skin and subcutaneous tissue. Generally, as would be expected, the skin sutures break down in part. But the deeper stitches in the mucosa usually hold, and over them a useful layer of vascular granulation tissue has formed. The procedure adds no functional disability to that already produced by the extensive shattering of the jaw. If the wound has to be reopened in order to attend to the bony lesion the patient's condition is none the less bettered by the primary suture, since the amount of tissue lost has been thereby reduced.

That this plan, pursued by Major Valadier and myself in selected cases, is successful is made clear by some of the photographs of our cases shown at the Royal College of Surgeons last October. I hope to publish others later.

I am, Sir, yours faithfully,

H. LAWSON WHALE, M.D. Camb., F.R.C.S. Eng.,
Captain, R.A.M.C. (T.).

The Oral Department, No. — General Hospital, B.E.F.

HEART FAILURE IN PREGNANCY.

To the Editor of THE LANCET.

SIR,—I have read with much interest Sir James Mackenzie's short article upon this subject in THE LANCET of Jan. 12th. In it he says that "heart failure is essentially a question of myocardial efficiency." He gives as the most striking phenomena of the progress of heart failure the onset of dropsy, breathlessness, œdema of the lungs, and persistent increase of rate, or violent beating, of the heart in exertion. All medical men will agree with this statement, but it does not require the skill of one who has devoted special study to diseases of the heart to diagnose heart failure in this advanced stage. What is of paramount importance in the treatment of heart failure is the diagnosis of this condition in its earliest stages, and for this purpose we ought to be able to recognise the first sign of its onset.

Sir James Mackenzie says that the first sign of cardiac failure is "the patient's consciousness that certain efforts which he used to undertake with ease and comfort now give rise to distress." Surely this is the first sign in a large number of diseases and is not peculiar to cardiac failure; indeed, it is the first sign of advancing age even in the healthy individual. I agree that heart failure is a question of myocardial inefficiency, and I am absolutely confident that the first sign of this inefficiency is an over-stretching of the cardiac muscles, more especially those of the auricles, this over-stretching producing cardiac dilatation. It has been proved experimentally that the cardiac muscles act more strongly when somewhat over-stretched, and that only at a certain point in this over-stretching do they begin to show signs of failure; it is therefore evident that the *first* sign of cardiac failure is not a sensation of inefficiency on the part of the patient, as Sir James Mackenzie maintains, but that cardiac dilatation *commences* before any sensation of inefficiency is felt. This cardiac dilatation can be diagnosed by any medical man. The first indication of its presence is an extension of the area of cardiac dullness on the right; this extension indicates auricular dilatation, and when it is present it is a sure sign of *commencing* cardiac failure. There are some medical men who say they cannot percuss out the cardiac dullness, but I am sure that the power to do this is only a matter of practice, except in a few cases of defective auditory perception, such as are instanced in those individuals who cannot tell a false note from a true one on a musical instrument. I will not take up your valuable space by entering into a discussion as to the part that valvular defects play in cardiac failure, as this would greatly lengthen my letter.

My conclusions are these: (*a*) The first sign of heart failure is cardiac dilatation; (*b*) this cardiac dilatation is indicated by an increase in the area of cardiac dullness; (*c*) that it is at this stage of the disease that treatment should be given, so as to avoid dangerous and painful symptoms and the possibility of being too late to remedy the defect.

I am, Sir, yours faithfully,

Harley-street, W., Jan. 14th, 1918. LESLIE THORNE THORNE.

THE ADMINISTRATION OF BROMIDE.

To the Editor of THE LANCET.

SIR,—I have read with interest Dr. E. W. Adams's letter in your issue of Jan. 12th on the relative values of the potassium and sodium bromide salts. The theoretical considerations which he adduces are important, and he asks me to bring forward any definite evidence on the clinical side which would go to prove that the potassium salt is more efficacious than the sodium. As I was not doing any experimental work, the evidence that convinced me was purely the observation of clinical cases, and I found that in the smaller doses the potassium salt gave better results than the sodium.

I appreciate that such an observation is unsatisfactory to the scientific investigator, but I wrote my letter simply in the hope that my experience might be helpful to others who under present conditions might be called upon for the first time to treat a number of cases of functional nerve disease.

I am, Sir, yours faithfully,

Harley-street, W., Jan. 15th 1918. MAURICE CRAIG.

A CENTENARIAN DESCENDANT OF OLD PARR.—The death is announced of Sarah Anne Alexander, who died on Jan. 14th, the eve of her birthday, at Eckington Villa, Reigate, in her 101st year. Some particulars of her family connexions, quoted from *The Friend*, were published in THE LANCET of Feb. 17th, 1917, p. 283.

DONATIONS AND BEQUESTS.—By the will of the late Mr. William Gladstone, of Marchlands, Bo'ness, the testator left £500 each to the Glasgow Royal Infirmary, the Edinburgh Royal Infirmary, and Quarriers' Homes.—The late Miss Marrian Edith Whyman, of West Smethwick, has directed the trustees of her will to endow a bed in the General Hospital, Birmingham, in the Children's Hospital, Birmingham, and in the Queen's Hospital, Birmingham, in memory of her parents.—By will the late Mr. Philip Henry Vaughan has left £5000 to the Queen Victoria Convalescent Home, Bristol; £500 to the Bristol Royal Infirmary; and £15,000 and property in trust to the Home for Incurables.—The residue of the property of the late Mr. H. Shawe, of Scarisbrick, Lancs. (valued at £8252), is, after certain bequests have been made, to be equally divided between the Southport Infirmary and the Comfort Fund of the Ormskirk Military Hospital.

Obituary.

WILLIAM LAIDLAW PURVES, M.D. EDIN.,

CONSULTING AURAL SURGEON TO GUY'S HOSPITAL.

Dr. William Laidlaw Purves, whose death we announced last week at the age of 75, died on Dec. 30th last at Hardwicke Cottage, Wimbledon Common. He was the son of Dr. William Brown Purves, a surgeon at Edinburgh, and received his education at the High School and at the University in that city. His intended profession was that of the law, but feeling that his real bent was towards medicine, while working in a lawyer's office he pursued the studies which in after years were to give him a prominent place in the branch of surgery which he adopted. He went as ship's doctor in a whaler at the age of 19, spent three years in Australia, and then graduated M.D. at Edinburgh University in 1864, continuing his studies at Berlin, Vienna, and Paris. Later he settled in London, and in 1874 was appointed surgeon and lecturer in aural surgery at Guy's Hospital, becoming consulting aural surgeon there is 1904 He was also consulting ophthalmic and aural surgeon to the Hospital for Diseases of the Nervous System, and honorary aural surgeon to the Royal Normal College and Academy of Music for the Blind.

To the literature of his profession he added largely and contributed to Graefe's Archives, Onderzoekingen gedaan in the Physiologisch Laboratorium der Utrechtsche Hoogeschool, to the Transactions of the Royal Medical and Chirurgical Society, and other publications. A keen student of human nature, he contributed to general literature "The Authorship of Robinson Crusoe," "The 'O' Edition of Robeson Cruso," and "The First English Translation of Gil Blas." His interest in golf made him a recognised authority both on the history and practice of the game, and to his initiative the Royal St. George's Club at Sandwich owes much. He married a daughter of Mr. Patrick Adie, of Worton Hall, Isleworth, and one of his sons is now serving as a captain in Mesopotamia, while another died on active service last year.

Medical News.

EXAMINING BOARD IN ENGLAND BY THE ROYAL COLLEGES OF PHYSICIANS OF LONDON AND SURGEONS OF ENGLAND.—At the Second Professional Examination in Anatomy and Physiology, held on Jan. 3rd, 4th, 7th, and 8th, for which 65 candidates presented themselves, 41 were approved and 24 were rejected. The following are the names and medical schools of the successful candidates:—

Samuel Edward Amos, St. Thomas's Hospital; Christopher Howard Andrewes, St. Bartholomew's Hospital; Hawa Khairul Nisa Attaoullah, Ivy Constance Beach and Margaret Gladys Best, London School of Medicine for Women; Antoine Yves Cantin, London Hospital; Beatrice Lakeman Collins, London School of Medicine for Women and King's College; Allen Robert Crane, London Hospital; Gerald Cecil Wootton Curson, Guy's Hospital; Mohammed Abdel Kadr El Hennawy, St. Mary's Hospital; Edward Ernest Elt, King's College; Mark Garden, London Hospital; Myer Garfinkel, University College; Frederick Richard Hall, St. Thomas's Hospital; Reginald Rowley Halsall, Manchester University; Strafford Smith Hewitt, St. Mary's Hospital; John Walter Hulme, London Hospital; Aziz Yousif Ibrahim, King's College; Mabel Marian Ingram, London School of Medicine for Women; Thomas James and Leslie Middlemiss Jennings, St. Bartholomew's Hospital; Richard Owen Jones, Liverpool University; Eric John Llewellyn Jones-Evans, St. Thomas's Hospital; Henry Davies Llewellyn, University College, Cardiff; Evan Thomas Lloyd, Guy's Hospital; Kathleen Maria Boyce McArthur, London School of Medicine for Women; Horace Abe Nathan, King's College; William Albert O'Connor, Oxford University; Guillermo Bustillo Oliva, Liverpool University; Madeline Phyllis Parker and Betsy Porter, London School of Medicine for Women; Montague Henry Renall, Cardiff and St. Bartholomew's Hospital; William George Rose, St. Mary's Hospital; Gerald Richmond Anderdon de Montjoie Rudolf, King's College; Edward Savage, Cardiff and St. Bartholomew's Hospital; Joseph Stanley Thomas, London Hospital; Leslie Ralph Augustus Wells, Guy's Hospital; Alfred Clarence Samuel Whiteway-Wilkinson, University College; May Grant Williams, London School of Medicine for Women; Edric Frank Wilson, Guy's Hospital; and Greta Isabel Yeoman, London School of Medicine for Women.

At the quarterly examination in Practical Pharmacy held on Jan. 10th the following candidates were successful:—

Norman Arthur Austin, Birmingham University; Richard Alec Dudley Jefferson Bernhardt, Middlesex Hospital; Maurice Charles Breese, Westminster Hospital; John D'Arcy Champney, Bristol University; Carl Knight Cullen, London Hospital; Charles Bertram Dyson, Cambridge University and University College Hospital; John Henry Cox Eglinton, Bristol University; Gwilym Pennant Evans, St. Mary's Hospital; Arthur James Fenn, King's College; Mabel Purefoy FitzGerald, Edinburgh University; Harold Franklyn, Cambridge University and St. Bartholomew's Hospital; Harold Percy Gabb, University College Hospital; Frank Tandy Harrington, Guy's Hospital; William Bertram Hargreaves, Manchester University; Walter Anley Hawes, Guy's Hospital; Walter Ernest Heath, Cambridge University and St. Bartholomew's Hospital; Mahmoud Fahmy Ismail, Guy's Hospital; William Austen Jackman, Bristol University; Florence Maitby Kerruish, Liverpool University; Abd el Aziz Abul Khair, St. Bartholomew's Hospital; Wilfred Kilroe, King's College Hospital; George Strickland Lewis, Bristol University; Pierce Lloyd-Williams, St. Thomas's Hospital; Harold Octavius Long, Guy's Hospital; Gwilym Evan Morgan, Oxford University and London Hospital; John William Meiss Newsome, Middlesex Hospital; James Lucius Camillo O'Flyn, University College, Cardiff; Daniel Joseph O'Meara, Guy's Hospital; Harry Palmer and Charles Cecil Rowland, London Hospital; Henry Mearns Savery, Middlesex Hospital; Harold Edward Smith, Sheffield University; Arthur Denis Symons, Bristol University; George Marston Trist, Charing Cross Hospital; Abram Adolf Weinger, King's College Hospital; Frederic Francis Wheeler, St. Mary's Hospital; and Evelyn Cecil Whitehall-Cocke, St. Thomas's Hospital.

ROYAL COLLEGE OF SURGEONS OF ENGLAND.—An ordinary meeting of the Council was held on Jan 10th, Colonel Charters Symonds, the Senior Vice-President, being in the chair. A vote of congratulation was passed to the President, Sir George H. Makins, and to Sir Charles A. Ballance on being made respectively Knight Grand Cross and Knight Commander of the Most Distinguished Order of St. Michael and St. George in recognition of their services in connexion with the war.—The best thanks of the Council were given to Colonel C. E. Shepherd for presenting to the museum a collection of the ear bones of bony fishes belonging to more than 600 species from all parts of the world and for his numerous other gifts to the museum during the last 11 years.—The best thanks of the Council were given to Sir Robert Jones for presenting to the library a collection of the published works of the late Mr. H. O. Thomas.—The names of two Members of the College, which had previously been removed from the Medical Register, were removed from the roll of Members.—The Senior Vice-President reported that Sir Anthony A. Bowlby, K.C.M.G., K.C.V.O., A.M.S., had consented to deliver the next Hunterian Oration, and accordingly appointed him Hunterian orator for the year 1919.—The secretary reported that no essay had been received on "Traumatic Aneurysm," the Jacksonian prize subject for the past year.

SOCIETY OF APOTHECARIES OF LONDON.—At examinations held recently the following candidates were successful in the subjects indicated:—

Anatomy.—E. Brazao, Middlesex Hospital; D. J. Davies, Cardiff; Gray R. Erskine, St. Thomas's Hospital; J. A. Hare, London Hospital; N. Howard, Liverpool; K. M. N. Isaacs and H. S. N. Menko, London Hospital; P. H. Salmond and I. A. Silverman, Middlesex Hospital; and J. Williams, Liverpool.

Physiology.—H. L. Bowen, Birmingham; E. Brazao, Middlesex Hospital; J. Herbert, Guy's Hospital; N. Howard, Liverpool; K. M. N. Isaacs, London Hospital; W. E. K. Kirby, University College; P. H. Salmond and I. A. Silverman, Middlesex Hospital; and J. Williams, Liverpool.

THE PRACTICAL STUDY OF BIOLOGY.—In connexion with the work of the Imperial Studies Committee of the University of London a course of ten public lectures on "Some Biological Problems of To-day" has been arranged, and will be held at University College on Mondays at 4 P.M., beginning Jan. 21st. The following are particulars with regard to the first five lectures: (1) "The Problem of Food," by Professor W. M. Bayliss; (2) "War Bread and its Constituents," by Professor F. G. Hopkins; (3) "Accessory Food Factors (Vitamines) in War-Time Diets," by Miss E. Margaret Hume; (4) "Alcoholic and Other Beverages," by Professor A. R. Cushny; (5) "The Possibilities of Increased Crop Production," by Dr. E. J. Russell. A further notice will be issued with regard to the second five lectures. The lectures are open to the public without fee or ticket.

LECTURES ON INFANT CARE.—A course of advanced lectures on infant care for mothers, nurses, health visitors, teachers, and infant welfare workers will be delivered under the auspices of the National Association for the Prevention of Infant Mortality, at 1, Wimpole-street, London, W., on successive Mondays during the first four months of the year, beginning on Jan. 28th and ending on April 22nd. The lecture hour will be 5.30 to 6.30 P.M. The lecturers are Lady Barrett, C.B.E., Dr. H. C. Cameron, Dr. F. P. Elliott, Dr. J. S. Fairbairn, Dr. David Forsyth, Dr. T. Shadick Higgins, Dr. R. C. Jewesbury, Professor Henry Kenwood, Dr. Eric Pritchard, Mrs. Scharlieb, C.B.E., Mrs. Shepherd, and Miss M. B. Synge. Particulars as to fees can be obtained from the secretary of the Association, 4, Tavistock-square, London, W.C.1.

ROYAL MEDICAL BENEVOLENT FUND.—At the meeting of the committee held on Dec. 11th last 42 cases were considered, and £410 voted to 38 of the applicants. This represents the largest number of applications received at a meeting of the committee. The following is a summary of some of the cases relieved:—

Daughter, aged 59, of M.R.C.S. Eng. who practised at Sheffield and died in 1867. Applicant was left without means. Has tried to earn a livelihood by acting as housekeeper, but owing to very defective eye-sight has had to give up the work. Has a grant of £30 from another charity. Voted £12 in 12 instalments.—Widow, aged 37, of M.D. Durh. who practised at Tamworth and died in April, 1917. Applicant was left with seven children, aged 15 years to 1½ years, with an income of £3 per week, which in these times she finds inadequate. Wants help towards the education of the children. Voted £10 and referred to the Guild.—Daughters, aged 57 and 55, of M.R.C.S. Eng. who practised at Cardigan and died in 1873. Applicants were left without means, and have tried to make a living by letting apartments, but have never been able to save. Owing to having had a very bad letting season this year, only having taken £35, they are in temporary difficulties. Relieved in 1897 and 1906. Voted £10.—Widow, aged 60, of M.R.C.S. Eng. who was in H.M. Prison Service and died in 1917. Applicant left unprovided for, as her husband's pension, which was their only income, ceased at his death. There are two daughters, who are now working as clerks, but they do not earn sufficient to meet the expenses of the home. Voted £12 in two instalments.—Widow, aged 60, of M.R.C.S. Eng. who practised at Kew and died in 1890. Applicant was left entirely without means and has earned a living by acting as housekeeper, but now finds it very difficult at her age to obtain work. Has one daughter, who is a hospital nurse and helps occasionally. Relieved once, in 1913, £7. Voted £5.—Widow, aged 47, of M.R.C.S. Eng. who practised at Whitstable and Bromsgrove and was killed in a motor accident on Nov. 2nd, 1917. Her husband had been a major in the R.A.M.C. and had been in France for 20 months, then invalided home. Applicant left without means with a son and daughter, ages 17 and 15. She hopes to get some work, but would like help towards her daughter's education. Voted £5 and referred to Guild.—Daughter, aged 70, of M.D. Lond. who practised at Chesterfield and died in 1886. Applicant at one time had private means, but lent money to her father on mortgage, and lost it all. She now suffers from ill-health. Only income £43 from two charities. Was helped by the Fund four times up to 1912. Voted £12 in 12 instalments.—Daughter, aged 59, of M.R.C.S. Eng. who practised at Hammersmith and died in 1908. Applicant is unable to earn her own living owing to ill-health. She receives occasional gifts of food and clothes from friends and the Guild assists. Relieved ten times, £44. Voted £18 in 12 instalments.—Daughter, aged 71, of M.D. Edin. who practised at Cheltenham and died in 1879. Applicant's sight is very bad and health indifferent. Income £39 10s. from other charities. Relieved four times, £48. Voted 12 in 12 instalments.—Widow, aged 56, of M.R.C.S. Eng. who practised at Yelverton and died in 1908. Applicant suffers from cataract in both eyes. Tries to make a living by taking in boarders, but not successfully. Relieved 11 times, £131. Voted £12 in 12 instalments.—Daughter, aged 60, of L.R.C.P. Lond. who practised at Brierley Hill and died in 1872. Owing to ill-health applicant is quite unable to work. Income £31 per year. Relieved 10 times, £77. Voted £12 in 12 instalments.—Daughter, aged 70, of M.R.C.S. Eng. who practised in London and died in 1875. Applicant was in Russia when the war commenced, and lost all her belongings, including her savings, which were in a Berlin bank. Now too old to work. Income, a pension from another society £30, and help from the Guild. Relieved four times, £37. Voted £12 in 12 instalments.—L.R.C.P. Edin., aged 79, married, who practised at Bervie, N.B. Applicant suffers from stoppage of the circulation and is confined to bed. His wife is also an invalid. Neighbouring doctors look after his very few patients, and his income is only £40 to £50. Relieved once, £24. Voted £24 in two instalments.—Daughter, aged 61, of M.R.C.S. Eng. who practised at Yoxford and died in 1898. Applicant quite unable to work owing to ill-health. Income from another charity, £29. Relieved nine times, £82. Voted £12 in 12 instalments.—Daughter, aged 51, of L.R.C.S. Glasg. who practised in London and died in 1873. Applicant used to earn a living by giving lessons, but of late has not been able to obtain pupils, has only earned £1 7s. this year. Income from dividends £22 12s. and help from the Guild. Relieved four times, £30. Voted £12 in 12 instalments.—Widow, aged 63, of M.R.C.S. Eng. who practised at Liverpool and died in 1895. Since the death of her husband applicant has made a bare living by nursing, and now, owing to old age and ill-health, is only able to undertake a limited number of cases. Relieved nine times, £73. Voted £12 in 12 instalments.—Daughter, aged 65, of M.D. Lond. who practised at London and died in 1873. Along with two sisters she has a boarding house, but they are unable to make ends meet. They have about £46 from investments. Their present trouble is due to the recent death of their mother, who had a life-interest in some property. Relieved twice, £20. Voted £10.—Daughter, aged 57, of L.R.C.S. Glasg. who practised at Glasgow and died in 1883. Before the war applicant was able to earn a living by giving music lessons, but has only received £15 this year. Has received £12 from another charity. Relieved twice, £24. Voted £12 in 12 instalments.—Daughters, aged 57, 50, and 46, of M.R.C.S. Eng. who practised at Bodmin and died in 1912. The father had a life-interest in some property, and during his life-time they managed. None of them are able to do much, and their present income is about £5 each. Relieved twice, £36. Voted £18 in 12 instalments.—Widow, aged 75, of M.R.C.S. Eng. who practised at Rye and died in 1891. Applicant's income from investments and property is £50, but she has to pay about £7 a year for repairs. Has cataract, and only able to earn a little by needlework. Relieved twice, £24. Voted £12 in 12 instalments.—Widow, aged 61, of L.R.C.S. Irel. who practised in Cheshire and died in 1900. Has a little property, but all the profit goes in repairs. Takes in boarders, but has had a very bad season. Relieved once, £10. Voted £10.—Widow, aged 59, of L.S.A. Lond. who practised in London and died in 1894. Applicant was left unprovided for with two daughters, both of whom are now working and pay the rent. Owing to indifferent health applicant is unable to earn sufficient to keep her. Voted £12 in 12 instalments.—Widow, aged 79, of M.R.C.S. Eng. who practised at Holderness and died in 1886. Earns a living by letting rooms. Receives £10 a year from children and occasional gifts from friends. Has indifferent health. Relieved seven times, £84. Voted £12 in 12 instalments.—Daughter, aged 39, of M.R.C.S. Eng. who practised at Streatham and died in 1914. Only income £17 from dividends. Lives with mother, who is ill. Applicant herself suffers from ill-health. Relieved three times, £15. Voted £5.

Subscriptions may be sent to the acting honorary treasurer, Dr. Samuel West, at 11, Chandos-street, Cavendish-square, London, W.1.

WEST LONDON MEDICO-CHIRURGICAL SOCIETY: PRESENTATION TO MAJOR H. E. PRIESTLEY.—At a clinical meeting of the society held at the West London Hospital on Jan. 11th the triennial gold medal, awarded last year for exceptional heroism in the discharge of medical duties, was presented to Major H. E. Priestley. The Mayor and Town Clerk of Kensington were present, the Mayor of Hammersmith being prevented by illness from attending. Dr. A. J. Rice-Oxley, who presided, outlined the history of the medal, which was founded by Dr. Phineas Abraham (President, 1910–1911). The first recipient was the late Professor Albert Neisser, of Breslau, the second Professor Arthur Keith, while last year Dr. Abraham presented two medals, one to be awarded to a member of the Naval and of the Army Medical Service, the names chosen being Fleet-Surgeon Francis Bolster, R.N., for heroism on a sinking ship during the battle of Jutland, and Major Harold Edgar Priestley, C.M.G., R.A.M.C., for services to the sick and wounded at the Wittenberg Camp during the typhus epidemic. Dr. Rice-Oxley recalled some of the harrowing details of the camp of 12,000 prisoners of war in which Major Priestley and his colleagues, Captain J. L. Lauder and Captain A. C. Vidal, did their heroic work far from the din of battle, until themselves struck down by typhus. Major Priestley, in returning thanks, claimed that his conduct had been only that of any other respectable British medical man placed in similar circumstances. He related how the men were bullied and maltreated from the day of their entry into the camp, when they were struck with the butt-ends of the guards' rifles and hustled across the compound. The food was insufficient and of poor quality; sanitation practically non-existent. Driven by such ill-treatment prisoners naturally tried to escape, but not one of these men returned to the camp alive. In spite of practical starvation the men remained well-disciplined and the N.C.O's. were most helpful in carrying out the sanitary arrangements possible. Many volunteered for nursing, although it was clearly pointed out to them how dangerous were the duties. Major Priestley added that he regarded himself as holding the medal in trust for all the men who worked with him. Sir William Davison, K.B.E., said he voiced the feeling of Kensington in expressing his admiration for the splendid services rendered by Major Priestley to his countrymen and the other prisoners. At the conclusion of the meeting Major Priestley was unanimously elected an honorary member of the society.

DEVELOPMENTS IN THE LEEDS SCHOOL OF MEDICINE.—The Department of Physiology in the University of Leeds, so ably conducted by Professor de Burch Birch until his recent retirement after more than 30 years' tenure of his chair, is now about to undergo extension in consequence of modern developments in this important branch of medical science. The work of the teachers of physiology has been divided. Dr. H. S. Raper, formerly lecturer in pathological chemistry at the University of Toronto, and lately lecturer in physiological chemistry at Leeds, has been appointed professor of physiology and biochemistry; and Dr. C. Lovatt Evans, Schäfer prizeman in physiological research at University College, London, has been appointed to a new chair as professor of experimental physiology, or, as it will probably be called "Experimental Physiology and Experimental Pharmacology." This change illustrates in an interesting manner the trend of modern medicine and surgery. It is becoming more and more evident that an increasing contribution to their progress is rendered possible by a more detailed study of the chemical processes met with in health and disease, and the influence upon them of drugs and substances of known chemical composition. An example of this is furnished by the recent investigation of the antiseptic action of many substances containing active chlorine, which was undertaken early in the war by the department of organic chemistry of this University in conjunction with Dr. H. D. Dakin, F.R.S., a former student and member of the staff. These researches led to the introduction of two antiseptics, chloramine-T and dichloramine-T, which have now become widely used in the treatment of war wounds. It is not overstating the case to say that they have been responsible for the saving of thousands of lives and tens of thousands of limbs. To carry out efficiently the new schemes involved in the above changes increased accommodation will be necessary, chiefly in the form of additional laboratories for research. Considerable additions to the apparatus at present in the department of physiology will also have to be provided.

HOSPITAL ACCOMMODATION IN SCOTLAND.—The Ministry of Pensions has appointed a committee to consider the adequacy of hospital accommodation and facilities for treatment both of discharged service men and the civil population in Scotland. The Scottish section of the committee, which consists of Sir Arthur Boscawen (chairman), Sir Donald MacAlister, Dr. J. C. McVail (for the Insurance Commission), Dr. Leslie Mackenzie (for the Local Government Board) and Sir John Macaulay, has had a meeting in Edinburgh. It was decided in the first instance to assist the Scottish Insurance Commission to complete the information they had been getting as to hospital accommodation, facilities for nursing, and other matters in connexion with treatment before proceeding to any independent inquiry.

NOTIFICATION OF TUBERCULOSIS TO THE MINISTRY OF NATIONAL SERVICE.—The Public Health (Tuberculosis) Regulations, 1912 and 1916, have just been revised by the Local Government Board, so as to provide that medical officers of health, instead of furnishing the Army Council with particulars of male persons between certain specified ages who have been notified as suffering from tuberculosis, shall in future furnish such particulars to the Chief Commissioner of Medical Services at the Ministry of National Service. The object of the Order is to assist the Ministry, who have now taken over the duties of the Army Council with respect to enlistment. The operation of the Order is limited to the duration of the present war. Notifications are to be forwarded by post to the Chief Commissioner in a sealed envelope (which need not be stamped), and marked "O.H.M.S."

THE SERVICES.

ROYAL NAVAL MEDICAL SERVICE.

Fleet-Surgeon E. H. Meaden, C.M.G., placed on the Retired List with the rank of Deputy Surgeon-General.

To be temporary Surgeons: A. C. C. Craig, J. H. Kerr, R. L. Stewart, C. W. W. Armstrong, F. Caldecott.

ROYAL NAVAL VOLUNTEER RESERVE.

Surg. D. D. F. Macintyre to be Staff-Surgeon.

ARMY MEDICAL SERVICE.

Col. T. H. J. C. Goodwin, C.M.G., D.S.O., has been appointed acting Director-General of Army Medical Services on the retirement of Surg.-Gen. Sir Alfred Keogh, G.C.B.

Col. M. P. C. Holt, K.C.M.G., C.B., D.S.O., to be temporary Surgeon-General.

Lieut.-Col. F. S. Penny, C.M.G., relinquishes the rank of temporary Colonel on re-posting.

Lieut.-Col. F. J. Brakenridge, C.M.G., Lieut.-Col. J. H. Campbell, D.S.O., and J. H. R. Bond, D.S.O., to be temporary Colonels whilst employed as Assistant Directors of Medical Services of a Division.

ROYAL ARMY MEDICAL CORPS.

Major G. W. FitzGerald, R.A.M.C. (T.F.), to be temporary Lieutenant-Colonel whilst in charge of Fusehill War Hospital.

Majors relinquishing the acting rank of Lieutenant-Colonel on reposting: A. E. Smithson, W. M. B. Sparkes, D.S.O.

To be acting Lieutenant-Colonels whilst in command of a Medical Unit: Major A. W. Sampey, Major A. D. Waring, Major W. Davis, Capt. R. G. S. Gregg.

Major A. R. Greenwood to be acting Lieutenant-Colonel whilst in command of a Medical Unit.

Temp. Major C. W. Vipond, C.A.M.C., to be acting Lieutenant-Colonel and to command a Canadian Field Ambulance.

Temp. Major P. Burnett, C.A.M.C., D.S.O., and H. B. G. Newham, to be temporary Lieutenant-Colonels.

Temp. Hon. Capt. B. H. Alton to be temporary honorary Major whilst serving with No. 22 General Hospital.

Temp. Capt. A. E. Seller relinquishes the acting rank of Major on re-posting.

Temp. Capt. C. B. Heald to be temporary Major without increased emoluments.

Temporary Lieutenants to be temporary Captains: G. E. Beaumont, S. D. Bridge, D. A. Chamberlain, W. S. Sheppard.

To be temporary Captains: K. J. Aveling, G. W. Stone.

Lieut. (acting Capt.) R. Thorp, M.C., from R.F.A., Special Reserve.

R. P. N. B. Bluett, M.C., C. A. Dupont, and S. Pinion, late temporary Captains, are granted the honorary rank of Captain.

T. D. Renwick, late Captain, is granted the honorary rank of Captain.

To be temporary Lieutenants: E. A. B. Poole, G. R. Jeffrey, W. B. Vaile, E. Gandy, E. O. Hughes, A. P. Hall, O. Le F. Milburn, J. F. O'Mahony, G. B. Proctor, J. Mathewson, W. J. B. Lavery, C. E. Elliston, J. C. Duncanson, A. J. Ferguson.

H. Halsted to be temporary honorary Lieutenant.

R. M. Dodson to be temporary Honorary Lieutenant whilst serving with No. 22 General Hospital.

L. M. Earle to be temporary Honorary Lieutenant whilst serving with the British Red Cross Hospital, Netley.

Officers relinquishing their commissions: Temp. Capts. J. C. Matthews, D. M. Moffatt, J. B. Dunning, M.C. (on account of ill-health caused by wounds, and is granted the honorary rank of Captain), C. H. Lloyd, L. T. Burra, W. H. Neil (and is granted the honorary rank of Captain), J. R. Currie (on appointment under the Ministry of National Service), J. J. O'Kelly; Temp. Lieut. W. J. Weaver.

SPECIAL RESERVE OF OFFICERS.

Lieutenants to be Captains: J. W. Hyatt, A. B. Dummere, J. A. Hill, R. G. Simpson, W. Burridge, T. Stanton, G. G. Jack, D. Mitchell, H. C. Roberts, C. Tighe, J. A. Charles, W. B. Lawson, W. Garde-Brown.

Captains relinquishing their commissions: D. H. Paterson (on joining the Canadian A.M.C.), C. Weir (on account of ill-health).

TERRITORIAL FORCE.

Major G. W. Fitzgerald and Capt. C. C. Cuthbert are seconded.

Major (Brevet Lieut.-Col.) J. Wilson to be acting Lieutenant-Colonel whilst commanding a General Hospital.

Capt. (acting Major) E. G. Annis relinquishes the acting rank on an alteration in posting.

Capt. C. P. Lapage is temporarily placed on the permanent personnel.

Capt. N. McCall-Smith and Capt. R. B. Berry resign their commissions on account of ill-health contracted on active service, and are granted the honorary rank of Captain.

Capt. A. W. Harrington is restored to the establishment.

Capt. (temp. Major) O. K. Wright relinquishes his temporary rank on an alteration in posting.

Capt. J. Kearney, Capt. C. R. Handfield-Jones, and Capt. J. Farquhar resign their commissions on account of ill-health, and are granted the honorary rank of Captain.

G. G. Lyttle, late temporary Captain, R.A.M.C., to be Captain, for service with the Senior Division, O.T.C.

Medical Officer and Temp. Lieut. J. F. Gemmill, from 1st Battalion City of Glasgow Volunteer Regiment, to be temporary Major, Glasgow City Medical Volunteer Corps.

H. Ll. Rutter to be temporary Major, and A. H. Hobbs and W. S. Fraser to be temporary Captains, Northumberland Medical Volunteer Corps.

H. D. Johns to be temporary Captain, East Riding Medical Volunteer Corps.

Parliamentary Intelligence.

NOTES ON CURRENT TOPICS.

The Parliamentary Session.

PARLIAMENT is again in session after the Christmas recess. The House of Commons re-assembled on Monday, Jan. 14th.

Medical Examination of Recruits.

In introducing his Bill to deal with the cancellation of certificates of exemption from military service granted on occupational grounds, on Monday, Jan. 14th, Sir AUCKLAND GEDDES, the Minister of National Service, made a very brief reference to the medical examination of recruits. He said: I wish to-day that it were possible for me to describe the reforms which have been introduced in the system under which recruits are medically examined. Suffice it to say that the old system has been replaced by a new one, which, although it still shows a few raw edges, is a vast improvement on the old. I wish, too, that I could stop to tell of all the work which has been done to coördinate the demands of Government departments for medical men and to ensure an adequate supply of medical practitioners to meet the nation's needs in 1920, 1921, and so on. We must recognise, however, that the efficient working of the recruiting and medical machines rests finally upon a complete and accurate system of registration.

In the course of his speech Sir AUCKLAND GEDDES also said that it was the ambition of the Government that no man who had been severely wounded more than once should be sent back to the fighting line, but would so far as possible be returned to civil life and civil work to replace in some essential industry some young man who had not yet served his country in the field. He was determined that the Review of Exceptions Act should be administered with great care and consideration.

National Insurance Administration.

The report on the administration of the National Insurance Acts in England for the period of the war (1914–17) has been issued as a Blue Book. It deals, amongst other matters, with the arrangements which have been necessary in regard to medical service on account of the war.

HOUSE OF COMMONS.

MONDAY, JAN. 14TH.

Medical Grading of Recruits.

Mr. GILBERT asked the Minister of National Service whether the three grades into which men were now put after medical examination were divided into three subdivisions; whether not only the men but the tribunals had been refused any information as to which subdivision of a grade a man was put in; whether, in view of the assistance to employers, men, and tribunals such information would give, he would at once issue instructions that full particulars of the subdivision of the new grades should be given; and would he issue to the House full details of these subdivisions, so that it might be known how men were to be utilised in the future.—Mr. BECK (for Sir AUCKLAND GEDDES) replied: My honourable friend appears to have been misinformed about the system of medical grading of National Service medical boards. There are no subdivisions of any of the three grades for men who are fit for military service, and it would not be practicable from a medical point of view to make such subdivisions. Full information as to the scope of each grade is given to the tribunals, but it would not be possible to give either to them or to the employer or to the men themselves any information about the way in which the men are likely to be utilised in the Army. This is and must be determined

by the varying demands of the War Office for men for particular services and by many other considerations, none of which are constant.

American Medical Men in British Hospitals.

Sir R. COOPER asked the Under Secretary for War whether the recent replacement of British medical practitioners in our military hospitals by American practitioners had broken down; whether the British practitioners had been requested to return temporarily to work in military hospitals; whether he was aware of the disadvantage that had accrued to our wounded by the replacement of a fully experienced medical service by one which could have but little experience of disablement due to the peculiar conditions of war.—Mr. MACPHERSON wrote in reply: The facilities which we have given to the American Government to enable their officers to obtain experience of war injuries have not broken down. The number of practitioners in military hospitals varies with the number of patients in them.

TUESDAY, JAN. 15TH.

Treatment of Neurasthenic Soldiers.

Mr. KING asked the Parliamentary Secretary to the Ministry of Pensions whether, with a view to keeping discharged soldiers under treatment and control until fully cured, it was proposed to provide institutions in which they would be placed under the care of a committee or of officials consisting largely of lunacy experts; and, if so, how many beds were contemplated in such institutions.—Sir A. GRIFFITH-BOSCAWEN replied: I presume that the honourable Member refers to men discharged from service on account of neurasthenia. If so, I may remind the honourable Member that I have no power to keep discharged men "under control," but I am providing institutions in which the severer cases of neurasthenia may be suitably treated. Two such institutions have already been opened and others will be ready for occupation shortly. I am advised, however, that the milder cases of neurasthenia should not be retained in institutions, and that to place these cases under the care of lunacy experts, as suggested by the honourable Member, would not be in the interests of the patients.

WEDNESDAY, JAN. 16TH.

Presidents of Recruiting Medical Boards.

Mr. SNOWDEN asked the Parliamentary Secretary to the Ministry of National Service whether the statement made by the Chief Commissioner of Medical Service before the Select Committee on Medical Examinations that all members of the medical boards were civilians now was in accord with the facts; whether the president of the Derby recruiting medical board was a retired major, Royal Army Medical Corps, with no experience whatever of general practice; whether he still remained president of this board; was he aware that the conduct of this chairman had been notorious through the whole district for the way he had treated the men who came before him as recruits; whether he was aware that during the first seven weeks that this man acted as president of the medical board no less than six civilian doctors resigned; whether this president was now assisted, or was up to quite recently, by an elderly captain of the Royal Army Medical Corps; and whether steps would be taken at once to change the personnel of this board.—Mr. BECK replied: All members of the National Service medical boards are civilian medical practitioners. Certain of the presidents of the recruiting medical boards continued to act as chairmen of the National Service medical boards during the period of transference of the medical department from the control of the Army Council to that of the Ministry of National Service, but these have now been relieved with the exception of two, who will be relieved within a few days. The president of the recruiting medical board at Derby relinquished his position on Dec. 1st, 1917, and has been succeeded by a well-known highly qualified civilian medical practitioner. Inquiries are being made regarding the alleged conduct of the late president of this board.

Appointments.

MACMANUS, F. J., L.R.C.P. & S. Irel., has been appointed Certifying Surgeon under the Factory and Workshop Acts for the Killeshandra District of the County of Cavan.

MENZIES, E. G. D., M.B., Ch.B. Edin., Certifying Surgeon under the Factory and Workshop Acts for the Wolsingham District of the County of Durham.

DAVID, MARY L., M.B., Ch.B. St. And., Assistant Tuberculosis Officer for Fifeshire.

Vacancies.

For further information regarding each vacancy reference should be made to the advertisement (see Index).

AUSTRALIA, COMMONWEALTH OF.—One Biochemist, salary £450; Two Senior Bacteriological Technical Assistants, salary £336; and Three Bacteriological Technical Assistants, salary £216 per annum.

BERKSHIRE EDUCATION COMMITTEE.—Assistant School Medical Inspector. Salary £400 per annum.

BIRKENHEAD, BOROUGH HOSPITAL.—Junior House Surgeon. Salary £170 per annum, with board, &c.

BIRKENHEAD UNION.—Junior Resident Assistant Medical Officer. Salary at rate of £300 per annum, with board, &c.

BRISTOL ROYAL INFIRMARY.—House Physician and House Surgeon. Salary at rate of £120 per annum, with board, &c.

BURY ST. EDMUNDS, SUFFOLK HOSPITAL, Ampton Hall.—Assistant Resident Medical Officer. Salary £330 per annum, with board, &c.

CHILDREN'S INFIRMARY, Cleveland-street, W.—Female Assistant Medical Officer. Salary at rate of £250 per annum, with board, &c.

GLAMORGAN COUNTY COUNCIL.—Temporary Female Medical Officer. Salary at rate of £350 per annum.

HAMPSTEAD GENERAL AND NORTH-WEST LONDON HOSPITAL.—Gynæcologist.

HASTINGS, EAST SUSSEX HOSPITAL.—House Surgeon. Salary £150 per annum, with board, &c.

HOSPITAL FOR CONSUMPTION AND DISEASES OF THE CHEST, Brompton-road, S.W.—House Physician for six months. Salary 30 guineas.

HOSPITAL OF ST. JOHN AND ST. ELIZABETH, 40, Grove End-road, N.W.—Resident Medical Officer, unmarried, for six months. Salary at rate of £250 per annum, with board, &c.

HUDDERSFIELD COUNTY BOROUGH.—Female Assistant Medical Officer of Health. Salary at rate of £300 per annum.

LEEDS CITY, PUBLIC HEALTH DEPARTMENT.—Female Medical Assistant. Salary £400 per annum.

LIVERPOOL, DAVID LEWIS NORTHERN HOSPITAL.—House Surgeon for six months. Salary at rate of £150 per annum, with board, &c.

MAIDSTONE, KENT COUNTY OPHTHALMIC HOSPITAL.—Temporary Aural Surgeon. Salary 50 guineas for six months, with lunch.

MANCHESTER CITY EDUCATION COMMITTEE.—Temporary Assistant School Medical Officer. Salary £400 per annum. Also Female Assistant School Medical Officer. Salary £350 per annum.

NEW HOSPITAL FOR WOMEN, Euston-road.—Female Senior Clinical Assistant. Also Clinical Assistants for the Out-patient Department.

OLDHAM COUNTY BOROUGH.—Assistant Schools Medical Officer. Salary £325 per annum.

PUTNEY HOSPITAL, Lower Common, Putney, S.W.—Resident Medical Officer. Salary £150 per annum, with board, &c.

QUEEN'S HOSPITAL FOR CHILDREN, Hackney-road, Bethnal Green, E.—Temporary Medical Officer as Surgeon. Salary £25 per annum. Also House Surgeon for six months. Salary at rate of £100 per annum, with board, &c. Also Medical Officer in charge of Electrical Department, for six months. Salary at rate of £100 per annum.

ROCHDALE INFIRMARY AND DISPENSARY.—Senior House Surgeon. Salary £400 per annum, with board, &c.

ROCHESTER, KENT, ST. BARTHOLOMEW'S HOSPITAL.—Resident Clinical Assistant. Salary at rate of £110 per annum, with board, &c.

SALFORD ROYAL HOSPITAL.—Honorary Assistant Surgeon.

SHEFFIELD ROYAL INFIRMARY.—House Physician. Salary £120 per annum, with board, &c.

SWANSEA EDUCATION COMMITTEE.—Assistant School Medical Officer. Salary £350 per annum.

WILTS COUNTY COUNCIL.—Oculist and Assistant School Medical Officer, Salary at rate of £400 per annum.

WIMBLEDON BOROUGH, PUBLIC HEALTH DEPARTMENT.—Female Assistant Medical Officer of Health. Salary £350 per annum.

THE Chief Inspector of Factories, Home Office, S.W., gives notice of a vacancy for a Certifying Surgeon under the Factory and Workshop Acts at Ramsgate, Kent.

Births, Marriages, and Deaths.

BIRTHS.

BONNEY.—On Jan. 10th, at Vicarage-gardens, Kensington, Gertrude Mary, wife of Ernest H. Bonney, M.R.C.S., L.R.C.P., of a daughter.

DAVIES.—On Jan. 11th, at Llangar, Wellington College, the wife of H. Morriston Davies, M.D., F.R.C.S., of a daughter.

JAMES.—On Jan. 7th, at Berry House, Bodmin, Gladys, wife of Captain A. H. James, R.A.M.C., of a daughter.

MCCHEYNE PATERSON.—On Jan. 14th, at Royston, Cecil Park, Pinner, the wife of Captain R. McCheyne Paterson, R.A.M.C., of a son.

PURSER.—On Jan. 11th, at Two Oaks, Guildford-road, Woking, the wife of Major L. M. Purser, R.A.M.C., of a son.

THOMAS.—On Jan. 11th, at Sherriff-road, West Hampstead, Norah, wife of Captain Donald Carmichael Thomas, R.A.M.C., of a son.

MARRIAGES.

GRIFFITH—KENNEDY.—On Jan. 12th, at the St. John's Wood Presbyterian Church, N.W., Walter S. A. Griffith, M.D., Harley-street, W., to Ella F. Kennedy, niece of Surgeon-General and Mrs. Don, Cranfield-gardens, N.W.

SUTTON—DAVIS.—A marriage was celebrated on Oct. 23rd between Captain Harvey Sutton, A.A.M.C., of New College, Oxford, and Trinity College, Melbourne, and Miss Beatrice Davis, daughter of Mr. Arthur H. Davis, of Marden, Toorak, Melbourne.

DEATHS.

APPLEBY.—On Jan. 8th, at Barnbygate House, Newark-on-Trent, suddenly, Lieutenant-Colonel F. H. Appleby, V.D., R.A.M.C. (T.F.), aged 74 years.

MOYES.—On Jan. 9th, at Ravenscroft-avenue, Golder's Green, Andrew Moyes, M.B., C.M., D.Ph., aged 59 years.

RAY.—On Jan. 2nd, at Addison Mansions, West Kensington, Sidney Keyworth Ray, Colonel, A.M.S. (retired), in his 82nd year.

SCOTT.—On Jan. 6th, on active service, at a casualty clearing station, of pneumonia, Samuel Geoffrey Scott, M.A., B.M., B.Ch., Captain, R.A.M.C., aged 42 years.

SPOOR.—On Dec. 18th, accidentally killed abroad, Captain Herbert M. Spoor, M.C., R.A.M.C., attached R.G.A.

WICKHAM.—On Jan. 14th, at Tetbury, Glos., William Wickham, M.R.C.S., L.R.C.P., L.S.A., aged 80 years.

N.B.—A fee of 5s. is charged for the insertion of Notices of Births, Marriages, and Deaths.

Medical Diary for the ensuing Week.

SOCIETIES.

ROYAL SOCIETY, Burlington House, London, W.

THURSDAY.—Papers:—Prof. A. N. Whitehead: Graphical Solution for High Angle Fire.—Mr. S. Pickering: Flocculation.—Dr. J. Aitken: Revolving Fluid in the Atmosphere.—Hon. R. J. Strutt: Ultra-violet Transparency of the Lower Atmosphere and its Relative Poverty in Ozone.—Prof. A. Fowler: The Pressure in the Solar Spectrum of the Water-vapour Band 3064.—Prof. A. Fowler and Mr. C. C. L. Gregory: The Ultra-violet Band of Ammonia and its Occurrence in the Solar Spectrum.

ROYAL SOCIETY OF MEDICINE, 1, Wimpole-street, W.

MEETINGS OF SECTIONS.

Thursday, Jan. 24th.

NEUROLOGY (Hon. Secretaries—C. M. Hinds Howell, H. G. Fearnsides): at 8.30 P.M.

Short Papers:

Dr. Wilfred Harris: Functional Muscular Atony.

Dr. Leonard Guthrie: Muscular Atony and Changes in Nutrition associated with Lesions of the Sensory Cortex of the Brain, with especial reference to the possible existence of Trophic Representation in the Post-central Areas.

Dr. George Riddoch: Muscular Atony and Nutritious Changes associated with Lesions of the Posterior Columns of the Spinal Cord and the Posterior Spinal Nerve-roots.

Friday, Jan. 25th.

STUDY OF DISEASE IN CHILDREN (Hon. Secretaries—A. S. Blundell Bankart, G. E. C. Pritchard, C. P. Lapage): at 4.30 P.M.

Cases:

Dr. J. L. Bunch: A Case of Vitiligo.

Dr. H. C. Cameron: (1) Cases of Cretinism showing Delay of Epiphyseal Development; (2) Cases of Chronic Kidney Disease with Osteomalacia and Infantilism.

Paper:

Dr. Carnegie Dickson: Congenital Obliteration of the Bile Ducts.

TUBERCULOSIS SOCIETY, at the Royal Society of Medicine, 1, Wimpole-street, W.

MONDAY.—8 P.M., Discussion on Farm Colonies in the Treatment of Tuberculosis (opened by Sir Robert Philip, Dr. T. D. Acland, Dr. N. Bardswell, and Mr. A. H. Macpherson).

LECTURES, ADDRESSES, DEMONSTRATIONS, &c.

ROYAL COLLEGE OF SURGEONS OF ENGLAND, Lincoln's Inn Fields, W.C.

Course of Ten Lectures on the Anatomical and Physiological Principles underlying the Treatment of Injuries to Muscles, Joints, and Bones:

MONDAY.—5 P.M., Lecture IV.:—Prof. A. Keith: The Modern Practice of Bone-Grafting.

WEDNESDAY.—5 P.M., Lecture V.:—Prof. A. Keith: Wolff's Law of Bone Growth.

FRIDAY.—5 P.M., Lecture VI.:—Prof. A. Keith: Specimens from the Army Medical Collection exemplifying Stages in Ankylosis.

POST-GRADUATE COLLEGE, West London Hospital, Hammersmith-road, W.

MONDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye. Dr. Simson: Diseases of Women.

TUESDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

WEDNESDAY.—10 A.M., Dr. Arthur Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THURSDAY.—2 P.M., Medical and Surgical Clinics. X Rays. Mr. Gray: Operations. Mr. B. Harman: Diseases of the Eye.

FRIDAY.—10 A.M., Dr. Simson: Gynæcological Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Baldwin: Operations. Dr. Banks Davis: Diseases of the Throat, Nose, and Ear. Dr. Pernet: Diseases of the Skin.

SATURDAY.—10 A.M., Dr. Arthur Saunders: Diseases of Children. Dr. Banks Davis: Operations of the Throat, Nose, and Ear. Mr. B. Harman: Eye Operations. 2 P.M., Medical and Surgical Clinics. X Rays. Mr. Pardoe: Operations.

THE THROAT HOSPITAL, Golden-square, W.

MONDAY.—5.15 P.M., Special Demonstration of Selected Cases.

THURSDAY.—5.15 P.M., Clinical Lecture.

ST. JOHN'S HOSPITAL FOR DISEASES OF THE SKIN, 49, Leicester-square, W.C.

TUESDAY.—4 P.M., Dr. C. Kempster: X Rays; Treatment of Hyperidrosis, Bromidrosis, Acne, Rosacea.

THURSDAY.—5 P.M., Chesterfield Lecture:—Dr. M. Dockrell: Vesicular and Bullous Eruptions and their Treatment.

BOOKS, ETC., RECEIVED.

HODDER AND STOUGHTON, London.
The German Terror in France. By Arnold J. Toynbee. 1s. net.
Soldiers of Labour. By Bart Kennedy. 1s. net.

LIBRAIRIE J. B. BAILLIÈRE ET FILS.
Diagnostic et Traitement de la Méningite Cérébro-spinale. Par le Dr. Dopter. 2 fr.

THERAPEUTIC DIGEST PUBLISHING CO., Cincinnati, Ohio.
Botanic Drugs: their Materia Medica, Pharmacology, and Therapeutics. By Thomas S. Blair, M.D.

WILLIAMS AND NORGATE, London.
Birth-rate and Empire. By James Marchant.

EDITORIAL NOTICES.

IT is most important that communications relating to the Editorial business of THE LANCET should be addressed *exclusively* "TO THE EDITOR," and not in any case to any gentleman who may be supposed to be connected with the Editorial staff. It is urgently necessary that attention should be given to this notice.

It is especially requested that early intelligence of local events having a medical interest, or which it is desirable to bring under the notice of the profession, may be sent direct to this office.

Letters, whether intended for insertion or for private information, must be authenticated by the names and addresses of their writers—not necessarily for publication.

We cannot prescribe or recommend practitioners.

Lectures, original articles, and reports should be written on one side of the paper only, *and when accompanied by blocks it is requested that the name of the author, and if possible of the article, should be written on the blocks to facilitate identification.*

Local papers containing reports or news paragraphs should be marked and addressed "To the Sub-Editor."

We cannot undertake to return MSS. not used.

Offices: 423, STRAND, LONDON, W.C. 2.

MANAGER'S NOTICES.

TO SUBSCRIBERS IN THE UNITED STATES.

Messrs. Wm. Wood and Co., of New York, have relinquished their Agency for the supply of THE LANCET in the United States. The Manager of THE LANCET will be pleased to supply copies direct from the London Office to subscribers in the United States at the strictly prepaid rate of $8 for twelve months. Subscriptions may commence at any time. Drafts and Money Orders should be made payable to the Manager, Mr. CHARLES GOOD, 1, Bedford-street, Strand, London, W.C. 2, England.

TO SUBSCRIBERS.

WILL Subscribers please note that only those subscriptions which are sent direct to the Proprietors of THE LANCET at their Offices, 423, Strand, London, W.C. 2, are dealt with by them? Subscriptions paid to London or to local newsagents (with none of whom have the Proprietors any connexion whatever) do not reach THE LANCET Offices, and consequently inquiries concerning missing copies, &c., should be sent to the Agent to whom the subscription is paid, and *not* to THE LANCET Offices.

Subscribers, by sending their subscriptions direct to THE LANCET Offices, will ensure regularity in the despatch of their Journals and an earlier delivery than the majority of Agents are able to effect.

THE COLONIAL AND FOREIGN EDITION is published in time to catch the weekly Friday mails to all parts of the world.

TO COLONIAL AND FOREIGN SUBSCRIBERS.

Subscribers abroad are particularly requested to note the rates of subscriptions given on advertisement page 5.

The Manager will be pleased to forward copies direct from the Offices to places abroad at the rates shown, whatever be the weight of any of the copies so supplied.

NEWSPAPERS FOR NEUTRAL COUNTRIES.

Newspapers are not at present being sent forward to neutral European countries unless posted direct from the office of publishers or newsagents who have obtained permission from the War Office for this purpose. The Publisher of THE LANCET has obtained the required permission, and he will forward copies direct from the Office to any neutral country on receipt of instructions.

METEOROLOGICAL READINGS.

(Taken daily at 8.30 a.m. by Steward's Instruments.)

THE LANCET Office, Jan. 16th, 1918.

Date.	Rainfall.	Solar Radio in Vacuo.	Maximum Temp. Shade.	Min. Temp.	Wet Bulb.	Dry Bulb.	Remarks.
Jan. 10	...	60	46	25	39	40	Cloudy
,, 11	...	54	44	37	42	43	Raining
,, 12	0·02	44	43	35	37	38	Cloudy
,, 13	...	60	42	27	27	30	Fine
,, 14	...	51	50	27	27	29	Overcast
,, 15	0·32	52	50	29	48	49	Cloudy
,, 16	1·15	46	37	30	34	35	Overcast

Other information which we have been accustomed to give in these "Readings" is withheld for the period of the war.

The following journals, magazines, &c., have been received:—American Journal of Surgery, St. Paul Medical Journal, Revista Medica del Uruguay, Journal of the Missouri State Medical Association, American Medicine, Revista de Medicina, Calcutta Medical Journal, Midland Medical Journal, Journal of State Medicine, Medical Review.

Notes, Short Comments, and Answers to Correspondents.

BOOKS OF REFERENCE.

THE circumstances of war have interfered considerably with publishing and printing arrangements, and are, no doubt, responsible for the belated appearance of the three following annuals, which have only just reached us. *Whitaker's Almanack, 1918* (12, Warwick-lane, London, E.C., price 3*s.* 6*d.* net), is a dear friend whose usefulness has been proved by 50 years' service. Its methods of setting forth astronomical and chronological information are well known to all, as are also its methodical and accurate articles on government, finance, population, commercial and general statistics of the various nations of the world, particularly with regard to the British Empire and the United States. Among matters receiving special notice are housing of the working classes and the liquor traffic. The Diary of the War is carried to the end of October, 1917.—*The New Hazell Annual and Almanack, 1918*, edited by T. A. Ingram, M.A., LL.D. (London: Henry Frowde and Hodder and Stoughton, price 5*s.* net), is a perfect storehouse of facts with regard to the war, and contains references to all important topics of the day, together with astronomical and other general information. It is now in its thirty-third year of issue, and, like *Whitaker*, forms an indispensable part of the reference bookshelf. Twelve of its 900 odd pages are devoted to a medical review of the year.—*The Wellcome Photographic Record and Diary, 1918* (London: Burroughs and Wellcome, price 1*s.*), contains simple and precise instructions for manipulating a camera and developing a photograph, so that even the beginner cannot fail to get some success. The principal features of the book, however, are the ready reference tables for development, printing, enlarging, focusing, and so forth, and the mechanical calculator fixed to the back cover which readily shows the correct exposure for any subject and any condition of light. Ruled diary pages are provided, as well as photographic memoranda pages.

LEPROSY IN THE OLD TESTAMENT.

IN works upon the history of medicine there has been great uncertainty as to the true diagnosis of what in the English Old Testament is rendered leprosy. A summary of various conclusions may be found under Sir J. R. Bennett's "Diseases of the Bible," London, 1891. An article by Dr. M. Jastrow, whose writings upon the medical knowledge in old Mesopotamia are well known, entitled "The So-called Leprosy Laws," throws quite new light upon the subject and renders much previous writing obsolete. He being a profound Semitic scholar, acquainted with Jewish literature as well as with cuneiform Assyrian and Babylonian texts and the Massoretic Leviticus, is enabled to show that of its 13th and 14th chapters but very few verses relate to lepra, and not any of them to leprosy—i.e., elephantiasis Græcorum. He proves that numerous expressions in verses 18 to 37 of Chapter xiii. are concerned, not with lepra but with burns, boils and sores. Several other verses of xiii. and xiv. are Hebrew *Gemara*, or comments added to the primal text.

To summarise shortly, the following is how Professor Jastrow believes verses concerning lepra stood in the original text:—

"If a man has upon the skin of his flesh a sara'at mark and he is brought to the priest and the priest sees the mark on the skin of his flesh, and the hair at the mark has turned white and that the mark appears deeper than the skin then it is a sara'at mark and he shall declare him unclean. If there is a sara'at mark on a man and he is brought to the priest and the priest sees that there is a white swelling on the skin, which has turned the hair white, it is a chronic sara'at and the priest shall declare him unclean. But; if the sara'at gradually spreads on the skin until the sara'at covers the entire skin and the priest sees that the sara'at covers the entire flesh, then the priest shall declare the mark clean. And the one afflicted with the sara'at who has a mark, his garments shall be torn and his hair grow wild and he shall cover his moustache and cry, Unclean. As long as he has the spot he shall be unclean."

These lines Professor Jastrow terms sara'at, or lepra, legislation. It is apparent that if this reduced form of the law is correct, all lengthy explanations of the Mosaic account of the disease founded upon other verses of Leviticus, as being descriptive of its symptoms, are obsolete, because they are only references to skin diseases

Communications, Letters, &c., have been received from—

A.—Messrs. Allen and Hanburys, Lond.; Mr. J. Adams, Lond; Dr. H. G. Adamson, Lond.; Dr. H. W. Abbott, Lond.; Messrs. Arnold and Sons, Lond.; Capt. W. H. Anderson, R.A.M.C.; Capt. G. Arthur, R.A.M.C; Lieut.-Col. J. G. Adami, A.D.M.S.; Alnwick Infirmary, Acting Hon. Sec. of; Messrs. Claudius Ash, Sons, and Co., Lond.; Messrs. G. and J. Abbott, Nottingham.

B.—Lieut. A. Brown, R.A.M.C.; Dr. S. K. Basu, Dacca; Messrs. W. H. Bailey and Son, Lond.; Rev. F. H. Bromwich, Laughton; Surg. F. J. Burke, R.N.; Bristol City, Analyst of; Drs. Buckmaster, Wettstein, and Holman, Effingham, U.S.A.; Capt. C. G. Brentnall, R.A.M.C.(T.); Messrs. Baillière, Tindall, and Cox, Lond.; Mr. S. Bhatta; Board of Education, Welsh Dept.; Mr. C. Bagshaw, Manchester; Dr. T. B. Broadway, Dorchester; Lieut. R. G. Barlow, R.A.M.C.; Messrs. Burroughs Wellcome and Co., Lond.; Dr. H. W. Bruce, Lond.; Mr. E. Bougault, Paris; Board of Education, Lond.; Mr. H. Burbridge, Spalding; Lieut. H. B. Barber.

C.—Mr. S. F. Cowell, Lond.; Messrs. Cowie and Co., Lond.; Messrs. E. Cook and Co., Lond.; Messrs. Carnrick and Co., Lond.; Messrs. J. and A. Churchill, Lond.; Mr. J. Cabburn, Lond.; Messrs. Condy and Mitchell, Lond.; Central News, Lond. (Advt. Dept.), Manager of; Mrs. G. W. Curtis, Exeter; Messrs. G. W. Carnrick Co., New York; C. E. A.

D.—Messrs. Down Bros., Lond.; Capt. T. N. Darling, R.A.M.C.; Darenth Industrial Colony, Dartford, Steward of; Mr. C. Dodgson, Lond.; Dr. L. W. Deichler, Philadelphia; Capt. S. R. Douglas, I.M.S. (retd.); Denver Chemical Manufacturing Co., Lond.; Messrs. Dale, Reynolds, and Co., Lond.

E.—Dr. W. Edgecombe, Harrogate; Messrs. Evans, Sons, Lescher, and Webb, Lond.; E. R. S.; Col. T. R. Elliott, D.S.O.; Dr. F. W. Edridge-Green, Lond.; Capt. J. Eason, R.A.M.C.(T.); Dr. H. A. Ellis, Middlesbrough; Capt. C. M. Elliott, R.A.M.C.; Capt. T. P. Edwards, R.A.M.C.(T.F.).

F.—Dr. G. FitzGibbon, Dublin; Messrs. Fannin and Co., Dublin; Lieut. J. Freeman, R.A.M.C.; Factories, Chief Inspector of, Lond.; Messrs. H. Frowde and Hodder and Stoughton, Lond.

G.—Prof. E. Glynn, Liverpool; Lieut. J. Geoghegan, R.A.M.C.; Major D. Graham, C.A.M.C.; Mr. E. T. Greenaway, Sidcup; Mr. B. C. Gupta, Calcutta; Dr. J. Gairdner, Crieff; Genatosan, Lond.; Messrs. S. Giuterman and Co., Lond.; Messrs. A. F. Gilkins and Co., Lond.; Messrs. Grantoff, Bride, and Co., Lond.

H.—Dr. A. F. Hewat, Edinburgh; Hoffmann-La Roche Chemical Works, Lond.; Messrs. T. Holland and Son, Lond.; Dr. A. G. Hurdman, Denver, U.S.A.; Mr. R. Hitchens, Lond.; Huddersfield Corporation, Town Clerk of; Mr. C. W. Hobson, Manchester; Mr. C. Higgens, Lond.; Messrs. Abel Heywood and Son, Manchester; Dr. W. Harris, Lond.; Huddersfield Corporation, Medical Officer of Health of.

I.—Incorporated Institute of Hygiene, Lond., Sec. of.

J.—Dr. R. W. Johnstone, Lond.; Capt. W. H. Johnston, R.A.M.C.; Messrs. George W. Jacobs and Co., Philadelphia

K.—Capt. J. T. Kyle, R.A.M.C.; Prof. A. Keith, Lond.; Kent County Ophthalmic Hospital, Maidstone, Hon. Surg. of.

L.—Liverpool Free Public Libraries, Chief Librarian of; Messrs. Lever Bros., Port Sunlight; Dr. D. Lawson, Nordrach-on-Dee; Messrs. H. K. Lewis and Co., Lond.; Dr. O. Leyton, Lond.; London Dermatological Society; Local Government Board, Lond., Asst. Sec. of; Miss M. Lyon-Mercado, Guildford; Messieurs G. Lebocq and Co., Paris; Messrs. Lee and Nightingale, Liverpool; Messrs. Percy Lund, Humphries and Co., Bradford; Lieut. A. J. Langhorne, R.A.; Sir Arbuthnot Lane, Bart., Lond.; Liverpool University Medical Library, Librarian of; London School of Tropical Medicine, Asst. Librarian of.

M.—Dr. H. A. Macewen, Lond.; Capt. R. B. Macfie, R.A.M.C.; Dr. A. Morford, Lond.; Messrs. J. A. Major's Co., New Orleans; Mr. W. E. Mayne, Belfast; Capt. C. McCoy, R.A.M.C.; Mrs. G. Myers, Edgbaston; Mr. W. MacLellan, Lond.; Messrs. J. Maclehose and Sons, Glasgow; Mrs. Malcolmson, Corstorphine; Manchester City Education Committee, Director of; Middlesex Hospital, Lond., Librarian of; Major E. K. Martin, R.A.M.C.; Mr. J. H. Melvin, Lond.; Dr. E. Mellanby, Lond.; Col. Mott; Mrs. Morison, Lond.

N.—Mr. S. Neave, Ingatestone; *National Food Journal*, Lond.; Dr. J. T. Neech, Halifax; Messrs. F. Newbery and Sons, Lond.

O.—Dr. H. R. Oswald, Lond.; Lieut. J. D. Oliver, R.A.M.C.; Mr. J. Offord, Lond.

P.—Messrs. F. E. Potter, Lond.; Dr. R. F. Priestley, Huelva; Col. W. Pasteur, C.M.G., A.M.S.; Capt. H. Platt, R.A.M.C.(T.); Sir Robt. Philip, Edinburgh; Public Health Laboratory, Manchester, Director of; Patent Office, Lond., Librarian of; Dr. C. T. Parsons, Lond.; Dr. A. Pettit, Paris; *The Prescriber*, Edinburgh, Manager of; Staff-Surg. R. J. G. Parnell, R.N.; Pharmaceutical Society of Great Britain.

Q.—Queen Mary's Hospital for the East End, Stratford, Sec. of.

R.—Dr. J. D. Rolleston, Lond.; Mr. B. J. Rodway; Lieut. H. L. Robinson, R.A.M.C.(T.); Dr. W. H. R. Rivers, Lond.; Royal Society of Arts, Lond.; Royal Medical Benevolent Fund, Lond., Sec. of; Dr. K. von Ruck, Asheville, U.S.A.; Dr. A. J. Routh, Lond.; Royal College of Surgeons in Ireland, Dublin, Registrar of; Major N. G. Russell; Capt. D. O. Riddell, R.A.M.C.; Royal Army Medical College, Lond., Commandant of; Royal Institution of Great Britain, Lond.; Dr. W. C. Rivers; Messrs. Reynell and Son, Lond.; Rochdale Infirmary, Sec. of; Dr. J. S. Robertson, Lond.; Royal Statistical Society, Lond.; Royal Society of Medicine, Lond., Librarian of.

S.—Dr. J. N. Sen, Jalpaiguri; Capt. A. Sunderland, R.A.M.C.; Salford County Borough, Town Clerk of; Messrs. Sells, Lond.; Prof. W. Stirling, Manchester; Messrs. G. Street and Co., Lond.; Mr. J. Spratt, Belfast; Société de Biologie, Paris, Sec. of; Capt. R. N. Salaman, R.A.M.C.; Salford Royal Hospital, Sec. of; Mrs. Geoffrey Scott.

T.—Dr. G. L. Tuck, Harbin; Taunton and Somerset Hospital, Taunton, Sec. of; *The Car*, Lond., Managing Director of; Messrs. W. Tkacker and Co., Lond.; Sir StClair Thomson, Lond.

V.—Messrs. J. W. Vickers and Co., Lond.; Capt. H. F. Vandermin, R.A.M.C.

W.—Mrs. M. F. Whish, Hove; Mr. D. P. D. Wilkie, Edinburgh; Messrs. W. J. Wilcox and Co., Lond.; Prof. W. Wright, Lond.; Col. Sir Almroth, Wright, C.B.; Wilts County Council, Trowbridge, County School Medical Officer of; Wimbledon Corporation, Town Clerk of; Messrs. Jas. Woolley, Sons, and Co., Manchester; Dr. S. West, Lond.; Messrs. Jas. Willing, Lond.

(*Continued at foot of next page.*)

of another nature. It is true that this word sara'at is in the full version of these chapters and elsewhere occasionally mixed with sentences concerning other diseases, but Professor Jastrow's opinion is that in these cases the word is a later erroneous gloss to the text. Confining attention to the medical side of the sara'at legislation, the shorter descriptions of symptoms now become quite clear. They are reduced to a skin disease of two types: a mild, or curable one; and a severe, or chronic form, or what as far as their medical knowledge went was believed to be chronic. The first had for incidence a spot or mark, with a tendency to spread. If it did this it was so innocuous as to be termed, from a priestly point of view, "clean." It appeared deeper than the skin, and changed the hair at the spot to white. The second type was marked by the swelling nature of the spot—i.e., the inflammation producing a spot, either in low or high relief. It also had the additional sign of the hair turning white, and, Professor Jastrow adds, "the appearance of raw flesh in the swelling"; but this does not appear in his wording of the shortened text. These Levitical notes as to the nature of the disease are inadequate to present views of scientific diagnosis and so leave the question of the precise nature of the illness "sara'at" somewhat uncertain. G. N. Münch, in his "Die 'Zarath' der Bibel," and Bennett consider it never stood for elephantiasis Graecorum—and this is the general view—but for lepra.

It does not seem that leprosy was prevalent either in Western Asia or Egypt at the time of the Pentateuch or it would surely have been mentioned among the disease curses of Deut. xxviii. The causes of the confusion of Biblical commentators between lepra and leprosy were explained by Bennett as being easily accountable.

COLONIAL HEALTH REPORTS.

Bahamas.—The Colonial Secretary (Mr. W. Hart Bennett), in his annual report for 1916–17, gives the estimated population of the Colony as 58,484. The birth-rate for the year was 36·6, and the death-rate 12·6 per 1000 of the population. Of the births registered 34·7 per cent. were illegitimate. The public health was very good. The so-called hospital (originally established in 1809 as a poor-house) has for a very long time comprised the hospital proper, infirmary, dispensary, lunatic asylum, and leper wards. During the year there were 804 patients treated, of whom 343 were discharged recovered, 190 relieved, 41 unchanged, and 109 died. At the close of the year there remained 58 patients in the Alexandra Hospital, 23 in the Victoria Jubilee Infirmary, 33 in the lunatic asylum, and 2 in the leper wards.

St. Helena.—In a report by the Acting Governor (Lieutenant-Colonel W. Dixon, R.M.A.) it is stated that the estimated civil population on Dec. 31st, 1916, was 3604. The strength of the Imperial garrison and St. Helenians in the crew of the cable-ship *Britannia* are not included in these figures. The birth-rate was higher than for some years, being 29·96 per 1000 as compared with 24·4 in 1915. The death-rate was 13·6 per 1000 as against 14·7 in 1915. Of the deaths registered 10 were over 70 years of age and 6 over 80, including one of 92 and one of 98. The health of the island was generally good, and apart from one short-lived outbreak of scarlet fever from which there were no deaths no infectious diseases were manifest. There was a small outbreak of chicken-pox which was not serious, though it caused one death. Of diphtheria and enteric fever there were no cases, which points to the efficiency of the sanitary arrangements of the island and of the concrete drinking-water tanks in the Half Tree Hollow district, where the diseases were formerly frequent. Tubercular cases have again slightly increased in number as have also cases of minor venereal disease. There were 168 admissions to the hospital during the year and the percentage of deaths was 5·9. The new operating theatre (the surgical fittings being presented by H.E. the Governor and Mrs. Cordeaux) was opened in May and has filled a long-felt want.

DR. LETTSOM.

To the Editor of THE LANCET.

SIR,—In his admirable lecture (THE LANCET, Jan. 12th) Sir StClair Thomson gives the usual rhymes written upon Dr. Lettsom. There is, however, another and less known rhyme. I met with it some years ago in *Notes and Queries*. It was written the day after a visit to the Epsom races by a young lady who kept her diary in verse:—

> "Next day it was enough to vex one,
> There came a bill from Dr. Lettsom.
> The bill was due that very day,
> And Pa had not enough to pay,
> For what was saved to pay poor Lettsom
> Was spent the day before at Epsom."

I am, Sir, yours faithfully,
S. D. CLIPPINGDALE.

Holland Park-avenue, W., Jan. 12th, 1918.

(*Continued from previous page.*)

Letters, each with enclosure, are also acknowledged from—

A.—Dr. H. W. Abbott, Lond.; Mr. J. M. Ashcroft, Croydon; Surg. G. L. Attwater, R.N.; Mr. J. S. Aitken, Mystic, U.S.A.; Anglo-French Drug Co., Lond.; A. R. M.

B.—Mr. J. E. Burton, Runcorn; Capt. A. J. Beveridge, R.A.M.C.; Surg. S. L. Baker, R.N.; Dr. T. D. Broadway, Dorchester; Mr. W. Bryce, Edinburgh; Messrs. Batger and Co., Lond.; Messrs. T. B. Browne, Lond.; Capt. S. G. Billington, R.A.M.C.; Mr. A. G. Berry, Lond.; Messrs. P. Blakiston's Son and Co., Philadelphia; Brighton and Sussex Medico-Chirurgical Society, Sec. of; Dr. F. T. Bibby, Flesherton; Bradford Guardians, Clerk to the; Mr. G. Birkett, Morecambe; Bristol General Hospital, Sec. of; Capt. W. Brown, R.A.M.C.; Dr. C. Bradford, Acocks Green; Mr. G. P. Butcher, Plymouth; Capt. H. C. Bazett, R.A.M.C.; Mr. R. B. Brown, Willington; Dr. R. A. Brewis, Dursley; Dr. G. Bowman, Manchester; Sir William Bennett, K.C.V.O., Lond.

C.—Mr. O. C. Coker, Bigbury; Dr. L. M. S. Clark, Lond.; Capt. A. H. Campbell, C.A.M.C.; Commission for the Prevention of Tuberculosis in France, Paris; Messrs. Crossley and Co., Lond.; Dr. H. C. Colman, Broughty Ferry; Cambridgeshire County Mental Hospital, Fulbourn, Clerk to the; C. S. H. R.; Mr. G. W. O. F. Clark, Plymouth; Mr. H. G. Commin, Bournemouth; Mr. F. W. Clarke, Chorlton-cum-Hardy; Nurse Clowes, Beccles; Mr. H. G. Crompton, Preston; Messrs. Cox and Co., Lond.; Capt. S. W. Coffin, R.A.M.C.; Dr. W. Calwell, Belfast.

D.—Dr. W. Donaldson, Flotta; Dr. W. T. Davies, Llanbister; Messrs. Dowie and Marshall, Lond.; Dr. T. S. Dowse, Exmouth; Dr. P. Diack, Lond.

E.—Egyptian Government, Cairo, Ministry of Finance; Messrs. Elders and Fyffes, Lond.; Col. P. Evans, C.M.G., A.M.S.; Mr. R. B. Eccles, Duffield; E. J. G.

F.—Messrs. Fletcher, Fletcher, and Co., Lond.; Mr. R. B. Frazer, St. Leonards-on-Sea; Messrs. Freame, Manning, and Co., Lond; Messrs. Faverger and Co., Lond.; F. W. C. W.; Mr. J. P. Fennell, Lond.

G.—Mr. R. H. Godbold, Lond.; Messrs. Gordon and Gotch, Lond. Grant College Medical Society, Bombay, Sec. of; Dr. A. Gomez, Mahon; Dr. S. Gill, Formby; Messrs. W. and A. Gilbey, Lond.; Dr. L. G. Guthrie, Lond.; Sir Rickman J. Godlee, Bart.

H.—Mr. E. T. Hargraves, Lond.; Miss K. Heanley, St. Ives; Hampstead General Hospital, Lond., Sec. of; Dr. T. B. Hearder, Ilkley; Mr. W. S. Handley, Lond.; Messrs. J. Haddon and Co., Lond.; Dr. R. Henry, Poulton-le-Fylde; Mr. J. J. Hemming, Margate; Dr. A. J. Hesterow, Coonoor; Dr. J. L. Hewer, St. Albans; Dr. C. Hawkes, Lond.

I.—Dr. T. Inglis, Portobello.

J.—Lieut. H. E. Jones, R.A.M.C.

K.—Col. W. G. King, I.M.S.; Dr. R. T. King, West Kirby; Lieut. S. H. Kingston, R.A.M.C.; King's College Hospital Medical School, Lond., Sec. of.

L.—Surg. J. Lambert, R.N.; Messrs. Philippe Letondu and Co., Lond.; Dr. T. A. Leishman, Brechin.

M.—Mr. G. E. Mould, Rotherham; Major J. H. Murray, I.M.S.; Mr. E. McIntyre, Mitcham; Mercantile Bank of India, Madras, Manager of; Mutual Subscription Agency, Philadelphia; Col. R. L. R. MacLeod, A.M.S.; Manchester Royal Eye Hospital, Sec. of; Dr. M. D. Morrison, Dominion, Canada; Mr. N. C. Macnamara, Chorley Wood; Dr. A. H. MacGregor, Malabar; Surg. C. J. A. McKillop, R.N.; Mr. W. Marriott, Kenilworth; Mr. J. McDonald, Falcarragh; Mr. W. Mitchell, Bradford; Mr. A. W. Matthew, Chingford; Messrs. J. F. Macfarlan and Co., Lond.; Dr. L. Molloy, Blackpool; Mr. T. C. Maxwell, Freetown; Dr. W. O. Meek, Frimley; Dr. C. R. P. Mitchell, Malvern; Lieut. J. C. Mead, R.A.M.C.; Mr. A. F. Messiter, Epworth; Mendip Hills Sanatorium, Wells, Medical Supt. of; Dr. Manos, Saito; The Meteorological Committee, Lond., Director of.

N.—Nottingham Guardians, Clerk to the; Northumberland County Council, Newcastle-on-Tyne, Acct. to the.

O.—Outlook Co., New York; Dr. J. O'Conor, Buenos Aires; Dr. E. Ofenheim, Lond.; Dr. J. A. Oakshott, Passage West.

P.—Dr. F. W. Prentice, Eugene; Dr. P. N. Panton, Lond.; Messrs. Philip, Son, and Nephew, Liverpool; Messrs. G. Pulman and Sons, Lond.; Pendyffryn Hall Sanatorium, Penmaenmawr; Fleet-Surg. J. H. Pead, R.N.; Dr. A. Porto, Rio de Janeiro.

R.—Dr. J. Reynolds, Lond.; Col. W. Ranson, D.S.O., A.M.S.; Dr. M. J. Ryan, Crumlin; Dr. E. D. Rowland, I.S.O., Georgetown; Mr. J. A. Renshaw, Sale; Dr. J. Reidy, Lond.; Messrs. Richardson and Co., Lond.; Dr. C. A. Rayne, Lancaster.

S.—Surg. H. K. Shaw, R.N.; Surg. J. F. Smith, R.N.; Messrs. W. H. Smith and Son, Lond.; Mr. C. H. Sproule, Toronto; St. Luke's Hospital Clinical Club, San Francisco; Messrs. Saward, Baker, and Co., Lond.; Dr. J. Saffley, Annan; Mr. G. B. Sellwood, Nordrach-on-Dee; Mrs. Sherman, Lond.; Capt. A. D. Stirling, R.A.M.C.; Dr. W. Scott, Crediton; Dr. P. C. Smith, Lond., Sheffield Corporation, Treas. to the; Capt. H. W. Spaight, R.A.M.C.; Dr. J. N. Sen, Krishnagar; Mr. G. C. Strong, Walton-on-Thames; Mrs. Scott, Bournemouth; Dr. W. Stewart, Southampton; Dr. E. Stainer, Lond.; Dr. Agnes Savill, Lond.

T.—Mr. A. F. Tredgold, Guildford; Mr. O. P. Turner, Addington; Mr. G. G. Turner, Newcastle-on-Tyne; Dr. R. Turner, Bootle; Dr. P. C. E. Tribe, Lond.; Dr. J. B. Tighe, Stanmington; Mr. J. Thin, Edinburgh; Messrs. Tindall and Jarrold, Chelmsford; Mr. W. T. Thomas, Liverpool; Mr. H. B. Tait, Lond.; Mr. G. E. Twynam, Lond.; Dr. L. T. Thorne, Lond.

V.—Mr. P. C. Varrier-Jones, Cambridge.

W.—Dr. J. F. Ward, Stockport; Mr. T. F. Wyse, Margate; Dr. J. A. Wilson, Warrington; Staff-Surg. R. J. Willan, M.V.O.; Mr. W. Webster, King's Lynn; Dr. J. J. Welply, Bandon; Surg. A. T. Woodward, R.N.; Mr. R. L. Wason, Winsley; Major C. G. L. Wolf, R.A.M.C.; Mr. R. S. Walker, Lond.; Western General Dispensary, Lond., Sec. of; Mr. A. Wilson Lond.